CW MI48106UIVYMUIVYMA FCNNB
UNIVERSITY MICROFILMS INTL
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Framingham, Mass. and additional mailing offices ©1982 by CW Communications/Inc.

/year July 12, 1982 Vol. XVI, No. 28

NEWSPAPER

Koufax to Face Ruth at Schibe

By Bruce Hoard
CW Staff

PHILADELPHIA — Imagine Sandy Koufax peering down from the mound at a sign from Roy Campanella. Babe Ruth is crouched insolently in the batter's box, waiting for a 100-miles-per-hour fastball. It's a hanging curve instead, but the Sultan of Swat times his swing perfectly, launching a towering home run deep into the left field seats of Schibe Park.

Sound fantastic? It could happen this Wednesday night when the greatest baseball stars of all time and a nationwide radio audience gather for "The Greatest Game Never Played."

Compliments of a computer, of course.

What started out last spring as a bull session among Don Weber and

(Continued on Page 8)

Burroughs, User May Settle Suit

By Bob Johnson
CW New York Bureau

DETROIT — A Burroughs Corp. spokesman confirmed here last week that an out-of-court settlement is being negotiated for a massive lawsuit brought against the vendor in May.

The Medical College of Wisconsin, Inc. is seeking combined damages of more than $160 million from Burroughs. The user filed a 14-page complaint May 4 in the Eastern District Court of Wisconsin, which charges that a Burroughs Hospital Information System (BHIS) that was supposed to provide computer hardware and software and a complete hospital administration accounting and financial system was of "substantially less value" than the system for

(Continued on Page 6)

User Says Relational, Yes; SQL/DS, Maybe

By Susan Blakeney
CW Staff

ORLANDO, Fla. — "From a long-range standpoint, we're convinced that relational is the way to go ... but we're not sure that SQL/DS provides the answer."

Those are the feelings of Nancy Gude, DP staff development manager for *The Orlando Sentinel*, the largest daily newspaper in central Florida. The paper is one of the first users of IBM's fully supported relational data base management system, SQL/DS.

SQL/DS is the acronym for Structured Query Language/Data System. Introduced in January 1981, it was designed to reduce installation time and simplify data access and management.

Gude said that the *Sentinel* chose SQL/DS because it provides its users with an easy-to-use query language and was less expensive than any of the alternatives it examined. The *Sentinel* uses SQL/DS to provide comparative sales information to the ad-

(Continued on Page 6)

Vendors Not Developing New Mainframe Packages; Industry Analysts Tell Why

By Lois Paul
CW Staff

Mainframe users looking for introductions of significant software packages have been disappointed so far this year. Vendors seem to have spent most of their efforts enhancing already available packages.

That does not mean, however, that vendors have stopped developing mainframe software. It just means that they have postponed those efforts.

This period of quiet in the development of mainframe packages is being attributed by analysts to the advent of microcomputers and the growth of consumerism within the software industry. "In terms of dollars spent, mainframe software still is going strong," noted Carol Weiszmann, manager of the Software and Services Information program at International Data Corp. in Framingham, Mass. "However, in terms of packages, the activity is strongest in the low end of the marketplace, especially in products for desktops or microcomputers," she explained.

Weiszmann sees a scramble among mainframe software vendors for shares in the desktop software market. "Anybody who can say that 'maybe in 10 years we will want a chunk of the market' has to go fight for it now," she said. "Companies have only a limited amount of resources to invest in new product development, so of course they are going to shelve their mainframe stuff for a while.

"By 1985 or 1986 — no later, I think — we are going to see an infusion of new lifeblood into the mainframe marketplace," she continued. "Once that new end-user market has been tapped and the lay of the land has been established, I think we are going to see a whole new level of activity with the mainframe end of the business — maybe even in the equipment end as well."

Herb Gepner, software analyst for Data Decisions, Inc. in Cherry Hill, N.J., said one reason for the lack of announcements of new mainframe software is the lack of announcements of new hardware.

"I really think everybody is looking more toward the micro market at this point," Gepner said, adding that nothing major is coming out of this area either. "Everybody is duplicating. The technology just has not broken."

Although he believes it is too early to use the term "saturated," Gepner

(Continued on Page 7)

Eight Enter Innocent Pleas In IBM Trade Secrets Case

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Eight suspects in a major industrial espionage case recently pleaded innocent to charges they participated in a scheme to steal IBM trade secrets.

The pleas were entered in U.S. District Court here July 1, just one day after the individuals were indicted for their alleged role in the theft plot [CW, July 5].

One of the suspects, Kunimasa Inoue, works as a programmer for Hitachi America Ltd. in nearby San Francisco. Two others, Kenji Hayashi and Isao Ohnishi, are employed as a senior engineer and section manager, respectively, at Hitachi America's parent company, Hitachi Ltd., in Japan.

Innocent pleas were also entered by Keizo Shirai, who works as a section manager at Nissei Electronics Ltd. in Japan, and Tom Yoshida, president of Santa Clara, Calif.-based NCL Data, Inc.

The three remaining suspects to be arraigned here July 1 include Barry Saffaie, product manager with National Advanced Systems, Inc. (NAS); Raymond Cadet, a former NAS and IBM employee; and Tabassom Ayazi, an Iranian student studying in the U.S.

Shortly after entering their pleas before U.S. Magistrate Nordin Blacker, Yoshida, Shirai and the three Hitachi employees were or-

(Continued on Page 2)

This Vice-President 'Networked' Long Before It Became the Fashion

By Lois Paul
CW Staff

DENTON, Texas — Although the term "networking" was not in vogue in 1949 when Mary Batchelor began working, she has used the concept well during her 32-year career in data processing.

Batchelor is vice-president of operations for Scott Instruments here. The company was formed in 1976 by her long-time associate, E.V. Scott; his son, Dr. Brian Scott; and Lee H. Hardesty.

Batchelor met the elder Scott at her first job at Chance Vought Aircraft, where she began in 1949 as a secretary in the engineering department. Scott took Batchelor and other Chance Vought people with him when he made job changes to

(Continued on Page 6)

Former Sheriff's Deputy Pulls Jail Term For 'Accessing' Ex-Employer's Data Center

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — A former sheriff's deputy has been convicted under the California computer crime law for repeatedly gaining unauthorized access to data belonging to the law enforcement agency where he once worked.

Ralph Davenport continued to avail himself of his ex-employer's data center months efter he left the Los Angeles County Sheriff's Department to go to work for a private investigation firm. Between October 1981 and last January, Davenport telephoned the data center at least 287 times and, after falsely identifying himseif as e law enforcement officer, asked to be supplied with various criminal histories from the installation's IBM 370/158.

He then used the ill-gotten information, which is intended for law enforcement personnel only, to benefit his new employer and his own privete investigations, according to local Deputy District Attorney Clifton Garrott.

Davenport's illicit activities were eventually detected and led to his arrest and subsequent conviction for computer fraud. On June 2, he was sentenced to six months in county jail and was put on four years' probation.

At no time during his four-month crime spree did the former deputy sheriff ever gain direct, on-line access to the data center's system or files, Garrott said. Instead, he got what he wanted through the installation's personnel, who were epparently convinced his requests for information were legitimate.

Modus Operandi

In general, Davenport's method of obtaining confidential crime data worked as follows: After calling the data center by telephone, he identified himself by one of several assumed names, all of which belong to bona fide sheriff's department investigators. He then asked his unsuspecting listeners to furnish him with information from one or another of the data center's crime histories, each of which lists e particular crook's physical description, last known eddress, conviction record end pending criminal charges.

If e data center operator was unable to answer the inquiry immediately and asked Davenport for his phone number, he usually claimed to be "out in the field" and offered to call again in "a couple of hours," Garrott said. Davenport then made good on his promise and had e clerk read the desired crime information to him over the telephone.

Davenport's fraudulent data-gathering scheme might still be operating had it not been exposed by accident several months ego. The discovery came when an unsuspecting data center employee called to leave e message for e narcotics division investigator whom the ex-deputy sheriff had just impersonated over the phone, Garrott said.

By sheer coincidence, the narcotics officer himseif happened to field the call and immediately denied ever having requested the information that the data center operator was trying to deliver. In the wake of that incident, the sheriff's department launched an investigation that eventually led to Davenport, Garrott said.

Suspects Plead Innocent

(Continued from Page 1)

dered to reappear in court Aug. 23, when their case is tentatively set to go to trial.

Each of the eight suspects in the industrial espionage scandal was allegedly involved in an illegal plot to buy top-secret IBM product information from undercover Federal Bureau of Investigation agents posing as electronics thieves. Altogether, the investigators received $648,000 in illicit payoffs in exchange for promises to supply highly sensitive design manuals, magnetic tapes and other technology that was allegedly repeatedly described to the suspects as stolen.

More than $620,000 allegedly came from businessmen representing Hitachi. The balance of the money was reputedly paid by representatives of another leading Japanese electronics firm, Mitsubishi Electric Corp.

All eight of the suspects who pleaded innocent here recently have been indicted only in connection with the Hitachi side of the alleged theft scheme.

In all, the scandal has resulted in indictments or charges against 22 individuals, nine of whom live in Japan, where their extradition status remains uncertain. All nine Jepanese citizens ere affilieted with Hitachi.

The remaining five suspects work for either Mitsubishi or its U.S. subsidiary. Unlike their Hitachi counterparts, none of the Mitsubishi group has been indicted yet because on June 30, ettorneys for the five suspects were granted e brief delay in presenting their case before e federal grand jury.

On the Hitachi front, Ayazi has been indicted for receiving and selling stolen property. Saffale and Cadet, meanwhile, have been indicted for transporting and receiving stolen property.

Cadet, whose alleged involvement in the IBM trade-secrets theft case was not disclosed until June 30, was taken into custody one day later and was soon released on bail.

The rest of the eight indicted suspects — Inoue, Hayashi, Ohnishi, Shirai and Yoshida — face charges of conspiring to transport stolen property.

This Week

IN DEPTH

Three Issues in Hiring Programmers ..Follows Page 50

NEWS

Four Mainframe Users Making Shift to Packages 4
IBM Follows STSC's Lead, Brings Out APL2 5
Software Developers Planting 'Booby Traps' 7
IBM Upgrades Two MCCUs, Enhances 3814 8
Washington Update 9
BOCs to Continue Terminal Support Until July '84 ..10
Terrorism Vexing International DP Crime Experts ...11
Computerized Editing Cuts Publishing Costs 12
Houston Agency Stops Paying for Its 370/138 14
Independent Evaluation Chides Postal Service 15
ADL Gurus Explore DP's Industrial Impact 18
Class to Examine CPU, I/O Capacity 18
Managers on the Move 20
County's DP Center Buys Time for Farmers 24
Processor Ends Conversions for Manufacturer 25
System Helps Firm in Battle Against Scoliosis 26
Film Studio Reviews Profitability With DBMS 27

EDITORIAL

Editorial: Probing Problem Drinkers 32
Reader Commentary: Data Relational Analysis 33
Human Connection: Staff Morale 33

SOFTWARE & SERVICES

APL*Plus With Nested Arrays Said Time-Saver 35
TI Ups Speed, Capacity, Performance of Dnos 36
'Docu/Master' Gets Vsam Support for FBA 38
On-Line Librarian Updated 39
'Adam' Targets DEC 'RMS' 42
'FSC-EPS' Debuts for Wang Minis 43

COMMUNICATIONS

Conteinet Said to Fit Multiple Vendors 45
Dial-Up Networks Get Bell-Compatible Modem 46

SYSTEMS & PERIPHERALS

University Operates Nonprofit DP Center 47
Subsystems Designed for Bar Code Scanning 48

MINIWORLD

Univac Adds Models to System 80 Mini Family 51

OFFICE AUTOMATION

Study: Top OA Pay in Diverse Regions 55
Oak Software Converts WP to System/38 56

COMPUTER INDUSTRY

DP Firms Cite Recession for Layoffs 57
Limited Partnership Develops VLSI-Based Super ...57
Civiletti Favors Minimal Controls on Videotex 59
Brown Sees Bright Side to IBM Sting Case 61

ADVERTISING INDEX 94

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM reg. U.S. Pat. Off.

Editor John C. Whitmarsh
Managing Editor Rita Shoor
News Editor Cheryl M. Gelb
Senior Editors:
Features Catherine Marenghi
Software Lois Paul
Communications Phil Hirsch
Systems Timothy J. Scannell
Office Automation Bruce Hoard
Industry Marcia Blumenthal
Management Brad Schultz
Writer/Analysts: Marguerite Zientara
Tom Henkel
Staff Writers: Jim Bartimo
Susan Blakeney
Correspondents:
New York Bob Johnson
Washington, D.C. Jake Kirchner
Phil Hirsch
West Coast Robert Batt
Jeffry Beeler
Chief Copy Editor Donovan White
Copy Editors: Dave Bouffard
George Cohen
Kathie Gow
Patricia Keefe
Steve Milmore
Betsy Morse
Deborah Scaduto
Barbara T. VanScoync
Editorial Assistants: Nancy Pinks
June Fettig
Contributors:
Education J. Daniel Couger
Taylor Reports Alan Taylor
Human Connection Jack Stone
SPECIAL PUBLICATIONS
Computerworld Extra!
Editor Jack B. Rochester
Computerworld OA
Editor Ann Dooley
Copy Editor Nancy Fleming

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:

New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Richard Hease, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481

W. Germany: Eckhard Utpadel, CW Publikationena, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 5215350

France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720 85 66.

Asia: Mr. Shohei Kurita, Computerworld Japan, 1-19-7 Shinonome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395130. Telex: SECCO AA25468

Brazil: Eric Hippeau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brasil. Phone: (021) 240-8225. Telex: 2130838(WORD BR)

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309

Spain: Neil Kelley, Computerworld/Espana, Barquillo, 38, Madrid-4

Denmark: Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 58, 1202 Copenhagen K. Phone: 01-1236-11

Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. Computerworld (ISSN-0010-4841) is published weekly, except: March (7 issues), June (5 issues), September (4 issues), October (5 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Copyright 1982 by CW Communications/Inc. All rights reserved.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc. Box 880, 375 Cochituate Rd., Framingham, MA 01701. ISSN 0010-4841/81 $3.00 + $.50

$1.50 a copy. U.S. — $44 a year, Canada, Central & So. America — $110 a year, Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

ABP mcc

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

"SHOCKING!"

The Facts of Life About Maintenance and Documentation.

(And how SYDOC can change 'em!)

Call (201) 568-9700.

In keeping with our tradition of printing "all the DP news that fits," we present *Six Unexpurgated Facts About COBOL Maintenance and Documentation:*

1. Very few programmers—male of female—have ever established a meaningful relationship with documentation. What they produce is seldom very good—and it's almost never updated.

2. The result is a generation what might be called "Orphan COBOL Programs." They may have fathers. And they may have mothers. But birth certificates they have not got!

3. The rub comes when you try to update these orphans to meet the demands of the brave new world of DP. You can try to deduce the logic of such orphans by referring to the source code. But that's a slow and dangerous business. And your name had better be Sherlock Holmes.

4. Or you can simply ask the author of the program about the underlying logic. But guess what? He or she has just left for an exciting new job in Tahiti.

5. What you're probably left with is hand-drawn hierarchical charts—a long bus ride from structured programming techniques. And if you try to insert new code without understanding the logic, watch out. You'll probably introduce so many bugs you'll never be free of the exterminator!

6. The cost to society is high. It's been estimated that as much as 80% of your entire DP budget may be going into modifying complex COBOL programs!

WITH SYDOC YOU CAN SAY GOODBYE TO ALL THAT: SYDOC is not a sort but a new and exciting Structured Documentation System. It takes the responsibility for documentation out of the hands of programmers and puts it on the broad shoulders of the computer. SYDOC works three ways:

1. SYDOC IS GREAT FOR MAKING MODIFICATIONS: It works like an X-Ray. It analyzes existing programs and prints out charts that tell you everything you need to know about the program's logic, hierarchical structure, variables, and relationships between statements. You can quickly and safely pinpoint code to be changed. And you're far less likely to introduce bugs because you *know* the logic.

2. SYDOC IS GREAT FOR DOCUMENTING NEW BORNS: It tracks new programs and automatically produces first-rate structured documentation. You have an accurate and concise record of every program your staff develops. A record that can never be lured away by an executive recruiter.

3. SYDOC IS GREAT FOR MANAGERS: It permits you to establish uniform, structured-documentation standards and stick to them. You don't have to nag programmers about documentation. The ball is in the computer's court.

So if you'd like to reduce the size of your COBOL maintenance budget, give us a call. Dr. SYDOC will be glad to put you on his famous "Waste Watcher" diet!

SYDOC: STRUCTURED DOCUMENTATION SYSTEM

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Four Mainframe Users Making Shift to Packages

By Susan Blakeney
CW Staff

Mainframe users are tending to buy rather than build software solutions, utilize microcomputers to perform some applications and are steering clear of unproven products, if interviews with four corporate DP managers last week are any indication.

David Blackwell, executive vice-president and chief administrative officer of Ball Corp.'s Information Services Division in Boulder, Colo., said his shop has "shifted from making to buying" whenever possible. He also said that Ball is purchasing more software now than a year ago because "it's more economical in the long run. It allows us to get on the street with a new system sooner."

Borg-Warner Chemicals, Inc. in Chicago is also more inclined to buy packages rather than produce home-grown software, according to John Brown, manager of systems and programming maintenance. Borg-Warner's software purchasing plans have not been hindered by the current economy, he said, claiming that he is buying more software now than last year.

Dick Sindt, DP manager at Bendix Corp., Ann Arbor, Mich., concurred on the strategy question. "We're leaning more and more toward buying, and we're buying more now than ever before.

"The whole Bendix Corp. is pushing us in that direction — it's more economical and you're going to get a more uniform package . . . without the idiosyncrasies of the home-grown applications," Sindt said.

Hertz Corp.'s staff vice-president of management systems and services in New York, Bruce Curry, also agreed that purchased software is the trend — but his company "tries to look at every major application" on the market before buying, and "if we have too many reservations about a package, we try to make it ourselves."

Curry maintained, however, that Reaganomics is impacting his department. "It's getting harder to justify new projects," he said.

Shift to Micro?

Asked whether they have been tempted to shift to comparatively inexpensive microcomputer hardware and software, the four managers' responses were fairly consistent. "We've definitely moved to standalone micro applications for certain things," Blackwell said, "and we've gone quite heavily into the mini market, too."

Brown said that although his company "very seldom looks to micros," it has brought a few in-house, and he foresees the micro infiltration spreading.

Curry said Hertz has started to do some work on micros and predicted future growth in that direction. Bendix does not use microcomputers, Sindt said, but he was careful to add "yet."

When polled on whether they sense a certain level of stability in the software industry, the DP managers differed in their responses.

Blackwell argued that the relatively stable vendors are the established ones, such as Cullinane Database Systems, Inc. and Pansophic Systems, Inc., but he pointed out that they are receiving competition from countless new companies. "The real challenge is going to be in acquisition — picking the software that has some staying power and can get the job done," he added.

Brown maintained that there is more stability in the industry now because the products have been around longer, and software is becoming more and more reliable.

Sindt and Curry were uncertain about the stability of today's software arena, but all four agreed that the industry is exploding and they are, therefore, leery of trying new and untried programs from relatively new companies.

Sindt summed up the situation by saying, "I always look at how a company is going to support me on these expensive software products . . . and certain companies will probably dominate the industry — McCormack & Dodge, Cincom, IBM. I wouldn't touch anything from anybody that was brand new."

No New Mainframe Packages Introduced

(Continued from Page 1)

acknowledged "that the mainframe marketplace has peaked. We have hit a lull.

"I can only hope that this plateau is, in fact, just a plateau, and that there will be some sort of a resurrection and a revival in the technological advancement area."

New Mainframe Products

The only new mainframe software products that Gepner could cite in the last six months have been in artificial languages and application generators. "There has been a lot of talk about relational data base management systems [DBMS] — a lot of talk and not very much action," he added.

Doug Crawford, manager of data base management services at Real Decisions Corp. in Stamford, Conn., disagreed with Gepner's assessment, noting the increasing availability and usage of relational systems.

Crawford also cited the information center as the development arena for a lot of new software products. His concern is that more development in the area of natural languages is required to fully take advantage of this concept.

Micro Software

In terms of microcomputer software, Crawford cited the need for standardization or at least the emergence of market leaders to stop the duplication described by Gepner.

Len Bergstrom, director of client services for Real Decisions, said the major growth he has seen has been in the area of decision support systems and microcomputer packages.

The overall growth rate of packaged software products during the 1980-1981 period was 45%, 14% higher than predicted by Input, Inc., according to Ken Churilla, director of that firm's information services industry program. The unexpected growth, which occurred mainly in the minicomputer and microcomputer areas, resulted in part because DP managers facing tight budgets are increasingly buying packages rather than attempting in-house development of software, he said. Another factor was the growth of microcomputers.

"I think software has really come of age," Churilla said. "I think 1981 was a turning point. I think we are going to see very strong growth over the next five years."

New Architecture

A spokesman for Info-Dyne, Inc. in Minneapolis described a trend toward a new software architecture among software developers as a means of reducing the labor-intensiveness of the development process and increasing the flexibility of their software products.

"They are creating more modular kinds of applications, with more submodules being usable across applications," the Info-Dyne spokesman explained.

He also echoed the feeling that software is becoming more of a consumer's market, with users becoming more knowledgeable and demanding more of the vendors.

Who's Affected: Vendors? Users?

Software industry watchers generally acknowledge that the economy has been a factor in slowing down the growth of the mainframe software market during the past year. They disagree, however, on whether it is the vendors or the users who have been affected.

Herb Gepner, software analyst for Data Decisions, Inc., noted that some large mainframe software houses are experiencing problems. In addition, firms are cutting back on research and development efforts, he added, partly because people costs are so high.

"I think that when the economy gets rolling again, you probably will see some pickup in marketing, and this, in turn, will reflect the ability for younger, smaller companies to break out with new ideas," Gepner said.

Regarding the effect of the economy on the software industry, Doug Crawford, manager of data base management services for Real Decisions Corp., feels it is the users who are experiencing the crunch. "I think the companies that would purchase the software services packages are definitely holding a little bit tighter rein on their purse strings right now in terms of usage of consulting and other services."

He shared Gepner's optimism about the future. "If the current signs are correct, we are entering into an upturn. I think if people have been holding back, they may let loose a little bit and you might see a spurt in purchasing of software systems and packages or software services."

RESPONSE TIME CAN BE VITAL

...B Bu But I'm sure I can find the missing funds just as soon as I get computer response...

HERE'S HOW TO MEASURE IT:

We manufacture a full line of Response Time and Line Utilization equipment for data communication lines. Our portable and modular rack-mount equipment is capable of monitoring most protocols, including async, bisync and SDLC/SNA.

For further information write or call
QUESTRONICS, INC.
3646 South West Temple Salt Lake City, Utah 84115 (801) 262-9923 TWX 910-925-4000
IN CANADA CALL:
ATELCO (416) 467-2208

IBM Follows STSC's Lead, Brings Out APL2

By Lois Paul
CW Staff

WHITE PLAINS, N.Y. — Following hard on the heels of STSC, Inc.'a recent announcement of a nested-arrays extension to its APL*Plus system [CW, June 28], IBM has unveiled APL2 software that includes general arrays. Like nested arrays, these may contain other arrays as well as a mixture of alphabetic and numeric data.

Available for users of IBM 370, 4300 and 30 series systems running under VM/370 with CMS, APL2 reportedly has extensions to APL operators, additions to APL primitive functions, programmable error handling, complex arithmetic, character set extensions and an extended APL syntax.

APL2 is an Installed User Program (IUP), according to IBM, which means it has been used and tested by a variety of VM/CMS internal IBM site users but has not gone through the lengthier process that generally precedes the release of a software product. Michael Crick, an independent APL consultant in Bellevue, Wash., suggested that the reason the vendor released an IUP is that "they wanted to get something into the marketplace as soon as possible to establish their position," especially since STSC got its nested-arrays extension out first, Crick said.

The extensions to the APL operators are said to include user-defined operators, use of defined functions with operators, new operators designed to improve the usability of general arrays and extensions to existing operators to eliminate previous restrictions.

According to IBM, additions to the APL primitive functions include a picture format to improve report preparation facilities, extensions to the grade function to allow sorting of both alphabetic and numeric data, new functions for text and string handling and mathematical functions, which extend the power of APL in numeric computations.

APL2 is written in assembler and only object code is being provided, an IBM spokesman said. It requires VM/System Product (SP), and the use of Ascii-coded terminals requires VM/SP Release 2.

The APL2 product is not considered a replacement for VS APL, according to IBM, and none of the workspaces shipped with VS APL are provided with APL2. Users who require access to those workspaces will require a VS APL license.

Changes to VS APL workspaces and auxiliary processors may be required for operation under APL2, the vendor noted. In addition, the APL-based information center products are not supported for use with APL2.

Crick said that the key to the relevance of IBM'a APL2 will be its similarity to STSC'a product. "If they can be treated as one language, it will essentially establish a new standard for APL and the language will move forward very rapidly," he said. However, if there are too many differences between the two APL versions, these variances, coupled with the other available versions of APL, will not be good for the language, he added.

Herb Gepner, software analyst for Data Decisions, Inc. in Cherry Hill, N.J., suggested that the release of APL2 puts IBM more firmly back in the remote processing business. "They have got to have it to situate themselves in that marketplace."

The initial license charge for APL2 is $1,950. The monthly charge is $650, IBM said from 1133 Westchester Ave., White Plains, N.Y. 10604.

Issco to Follow ISO Standard

SAN DIEGO — Issco has announced that it will release graphics software compatible with a standard recently proposed by the International Standards Organization (ISO).

According to Issco, the ISO standard differs significantly from a previously considered "core" proposal from the Association for Computing Machinery'a Special Interest Group in Computer Graphics. In particular, the ISO standard is said to avoid the "current position" approach considered by many to be an anachronism and has a more modern approach to graphics interaction.

Peter Preuss, president of Issco, said the new ISO option will be a fully integrated part of Issco'a Disspla and Tell-A-Graf software products.

The proposed ISO standard was discussed recently at a National Computer Graphics Association meeting in Anaheim, Calif.

Dr. Peter Bono, vice-president of product development for Athena Systems, Inc. in Pawcatuck, Conn., explained that the Graphical Kernel System (GKS) was accepted as a draft international standard at an ISO meeting held in June in Eindhoven, the Netherlands. As chairman of the American National Standards Institute X3H3 Committee, Bono led the U.S. delegation in the Netherlands.

U.S. technical objections to the proposed ISO standard were resolved at the June meeting, and Bono'a delegation then decided to vote positively on GKS. After further editorial change, the revised standard will become an international standard. "I fully expect that we will vote eventually to adopt it as a U.S. standard. I personally will be working toward that," he added.

Take Control

CA-JASPER...it's not just a batch job accounting and billing system...

It's much more. It's a TOTAL PERFORMANCE MEASUREMENT SYSTEM. Now both batch and CICS can have Real Time Performance Measurement and Online capabilities.

And, you can still monitor productivity and equipment; measure system performance; evaluate software; have a chargeback mechanism; control costs; and produce any desired analytical report through WIZARD.

The CA-JASPER family lets you do all these things. Like radar, it can help you find the way through the hidden perils of managing a data processing installation.

Send for more information TODAY.

CA-JASPER™

HEADQUARTERS
Computer Associates Building
125 Jericho Turnpike Jericho, NY 11753

Offices in the United States, Europe, Australia, Canada and Japan.
Distributed in 32 countries world-wide.

MAIL THE COUPON OR CALL TOLL-FREE
800-645-3003
[NY State Call: (516) 333-6700]
CANADA Call: (416) 842-2110

Member Software Industry Association

COMPUTER ASSOCIATES
125 Jericho Turnpike Jericho, NY 11753
YES! Send FREE information on CA-JASPER
Name
Title
Company
Address
City State Zip
Phone CPU OPSYS

CW/1282
Also send info. on:
☐ CA-SORT High Performance Sorting
☐ CA-DYNAM/D Disk Space Management
☐ CA-DYNAM/T Tape Management System
☐ CA-DYNAM/FI File Independence Facility
☐ CA-EARL Flexible Report Writer
☐ CA-DYNAM/DMF Data Management Facility
☐ CA-DRIVER Job Management System

Burroughs May Settle $160 Million User Suit

(Continued from Page 1)

which the Medical College originally contracted.

In its complaint, the Medical College contended that Burroughs breached its agreement for the hospital system "despite express and implied warranties." The college claimed that Burroughs failed to deliver various and complete software modules, software "reasonably free of errors," properly coded data bases and various applications modules including personnel, fixed-asset management and pharmacy modules.

In addition, the college said that Burroughs "failed and refused to provide the professional and support services" of a contract to which both parties agreed. The complaint alleged that Burroughs did not make its BHIS software system operable, did not provide or service an accurate patient accounting system, did not provide timely programming and did not provide user training.

It also charged that the vendor failed to utilize its talent in correcting problems within the BHIS system and failed to provide technically capable people of doing the necessary work.

Lost Business Charged

As a result of Burroughs' alleged breach of contract, the college said in its filing that it had lost business as the purchasing agent of a Joint Medical Computer Center (JMCC), a management entity that was set up to supply computer services to the college, the Good Samaritan Medical Center, Inc. and the Kurtis R. Froedtert Memorial Lutheran Hospital, Inc. The complaint stated that because of Burroughs' breaches, the Good Samaritan's business was lost and the college was prevented from obtaining the participation of other health-care providers for the JMCC.

Compensatory damages in the sum of $40.8 million are being sought from Burroughs by the college, which maintains that it was deceived by Burroughs' representations concerning the purchase of the computer system and support services. It further demands $120 million in punitive damages.

A spokesman for Burroughs was unable to give details on the specific hardware at issue. He would only comment that "the litigation was brought by the plaintiffs because of a technicality relating to the state statute of limitations. We do not believe that any damages will ultimately be proven and the parties are now engaged in negotiations to see if it can be resolved by settlement."

The attorney for the college, Michael R. Wherry, confirmed that negotiations for an out-of-court settlement were proceeding, but said that neither he nor his client had any other comment at the time.

Newspaper Lukewarm About SQL/DS

(Continued from Page 1)

vertising department on such items as current revenues, current linage and ad sales. The advertising people can query the system by accounts, type of advertiser and type of product and are utilizing the system to write reports.

Although SQL/DS has performed as well as Gude expected it to and "provides us with a temporary solution for a specific problem," she is skeptical about making a long-term commitment to it. One problem with SQL/DS, she said, is that it requires a lot of hardware resources to run.

"You need a very powerful mainframe if you have a large data base — and ours isn't that large," Gude said. When only one person is using the system, the response time is fine; but that is usually not the case at the newspaper, she pointed out.

The Orlando Sentinel uses a 3M-byte IBM 4331 Group 2 mainframe running under DOS/VSE. When it found it needed a query language that was accessible to users in the advertising department, it looked at Pansophic Systems, Inc.'s Easytrieve, but considered it too difficult.

The newspaper also looked at Software AG's Adabas and Cincom Systems, Inc.'s Total, Gude said, but "SQL/DS was the cheapest way from a software standpoint because we wanted to try a query language with a relational data base."

The *Sentinel* already had IBM's DL/1 DBMS and wanted something more versatile and user friendly. "We'd been searching for some kind of query language for three or four years," Gude recalled, adding that she believes it was the newspaper's sales force that first heard of SQL/DS.

The training involved in implementing SQL/DS consisted of an IBM users manual and a series of user tables. "We sat down with the people from advertising and took them through the manual . . . it took about 25 hours," Gude said.

Gude said that IBM's support of the new product has been "pretty good." While the local Orlando office is not terribly familiar with SQL/DS, "because it's a new product, there's nobody who is," she added.

Asked if she would recommend SQL/DS to others, Gude said that would depend on how the software would be used, pointing again to the problems with the response time.

She's Networked Since '49

(Continued from Page 1)

General Electric Co., University Computing Co. (UCC) and finally to his own firm, Scott Instruments.

Batchelor does not have a programming background and insists she has never wanted one. However, she joined Chance Vought Aircraft as a secretary after graduating from a 10-month business school program and began working with some very early pieces of computer equipment — the Selectronic Accounting Machine and 502 Electronic Calculator from IBM.

"In those days, when you talked about computer science, aircraft companies were one of the leaders in the scientific-computer type of application," Batchelor recalled. Working in this environment, Batchelor received her training on some of the first computers that were developed.

Her abilities were quickly recognized, and Batchelor went on to manage the firm's engineering computer department for 13 years. Subsequently she was hired by another ex-Chance Vought employee to manage GE's Chicago-based information processing center.

Scott had meanwhile moved to Phoenix, Ariz., where he was working for GE in its computer department. After several years, he hired Batchelor as a consultant and trainer for customers with large-scale computers.

When Scott moved back to Dallas to work for UCC, he brought Batchelor and some others with him to run another service bureau, the firm's utility network operation. She remained with UCC for about five years, until Scott's retirement prompted her exit. The two went into apartment management for six years.

At this time, Scott and his son conceived the idea of forming their own firm. Once again, Batchelor was swept along with the momentum. Scott Instruments was founded in 1976 to conduct research and develop devices for the profoundly hearing-impaired. It has progressed into the development of voice-recognition systems.

Theory of Work

As vice-president of operations for the growing young firm, Batchelor has put into action her theory of work: "My main goal is to get the job done, whatever it requires." She initially did all the secretarial work, bookkeeping and shipping and receiving.

Now the company has "kind of grown from under me," she noted. It now employes about 30 people.

The firm is in the initial stages of developing its computer network, which currently consists of microcomputers. However, a Digital Equipment Corp. VAX-11/750 is on order.

Batchelor always has been surprised by the lack of women managing large-scale computer operations. "When I first started, I really didn't know it was unusual. I not only managed the operations, but I used all women, which also was unusual," she added. "I still think that, generally, women are more organized and more methodical and thorough about the tedious part of the job."

Batchelor said she really has not experienced sex discrimination. "I was always very fortunate in that I worked with really good people and for really good people." Her feeling is that people do not care if you are male or female, as long as you do a good job.

Do your training dollars end up working at another company?

TRAINING & KEEPING DP PERSONNEL

The McGraw-Hill seminar that increases job satisfaction, reduces turnover, and improves productivity through training.

September 21-23, Los Angeles
October 27-29, Chicago

Not just another "Train the Trainer" seminar. Learn how to satisfy skill requirements plus individual needs with a proven, research-based system.

Effective needs assessment, job analysis, and career planning are crucial to the results-oriented training today's highly competitive marketplace demands. McGraw-Hill's newest seminar can give you the systematic approach you need to train and motivate.

For information and registration call 212/997-2466. Please register early. Attendance will be limited. Or write to:

Richard Peres - 29th floor
McGraw-Hill International
Training Systems
1221 Avenue of the Americas
New York, NY 10020

Halt Programs If Users Don't Pay

Software Developers Planting 'Booby Traps'

By Susan Blakeney
CW Staff

More than one clever software developer has found the solution to the "check is in the mail" syndrome.

Both to collect payment for software and to guard against piracy, software companies and independent programmers alike are planting "booby traps" in their programs that can bring them to a grinding halt.

The "booby traps" can take either of two forms. The first method involves implanting in the software a clock or timing device that goes off after a certain amount of time has elapsed, causing the software to stop executing; the second is the recurring code method, which stops all processing after a certain sequence has been repeated a predetermined number of times.

In either event, the user must contact his programmer or software house to learn how to get on-line again.

American Integrity Systems, Inc. (AIS) in Santa Ana, Calif., a microcomputer firm, is using the software booby traps both to protect its dealers from bad debtors and to keep clients from copying the software onto another system. AIS uses the "internal clock" methodology in its accounting software, set to "go off" at 30 days.

If the software is prepaid, the program goes out with a code already in it that keeps it from stopping. However, a client that does not prepay for the software must obtain the code from the dealer, either via a visit or a telephone call, or the system will crash after the allotted 30 days, AIS' Mike Fowler explained.

According to Fowler, users do not know why their systems crash. They receive error messages on their systems instructing them to "Call Your Dealer." If the user pays up front, on the other hand, "They never know [the booby trap] is there."

To safeguard against software pirates, AIS has also bugged its software with a registration number that corresponds to one client only. Once the software is programmed for a specific user, "the program is permanent," Fowler claimed.

Grid Systems Corp. of Mountain View, Calif., is another microcomputer company that is experimenting with the booby trap concept, although it has yet to be implemented. The company can install a clock/calendar chip in its turnkey systems, allowing it to enter "an expiration date when we download our programs," Barry Margerum, director of marketing communications and sales support at Grid, said. Margerum emphasized that while the company "has the capability" to booby-trap client software, "whether or not we choose to use it remains the question."

Grid also encodes its software with a tracking number so that it is almost impossible to use if copied illegally. Each customer of the turnkey company is assigned a number that is implanted in its operating systems; each subsequent piece of software purchased by the client is encoded with the same number. If the encoded program number does not match the one in the operating system (as is the case when software is copied), the program will not run.

(Continued on Page 8)

Halt Programs If Users Don't Pay

Placing "booby traps" in software programs may make bill collecting easier and help stop software piracy, but there's a flip side to the coin: A disgruntled programmer can use the same methods to sabotage his employer, causing software snafus long after he has left the company.

How can companies defend themselves? Donn Parker, senior management systems consultant at SRI International, Inc. in Menlo Park, Calif., said that software sabotage has been made "a serious crime in the 17 states that now have computer crime laws." To be on the safe side, Parker offered the following advice to security and DP managers:

- Establish a code of conduct at the company spelling out what is and what is not authorized activity. The code should point out all criminal laws and state that the company will prosecute violators.
- Attend "management sensitivity training" sessions to become more aware of any personal problems in the shop.
- Use informal, well-placed contacts throughout the shop.
- Establish individual task functions and a system of checks and balances to always keep the staff slightly on guard.
- Develop strategic employee termination policies, incorporating exit interviews to minimize bad feelings and disruption. Parker urged managers to go so far as to "send the employee to Bermuda for a couple of weeks" to keep him away from other employees and the equipment and to change the terminated employee's attitude from negative about the company to positive.

A novel of computer crime by Ed Yourdon

PLEASE CHARGE TO ☐ VISA ☐ MASTERCHARGE ☐ PAYMENT ENCLOSED

CARD NO. EXP. DATE

SIGNATURE

NAME

ADDRESS

CITY STATE

ZIP PHONE cw7/12/82

Yourdon Press 1133 Avenue of the Americas
New York, NY 10036-6748 (212) 730-2673

"A work of gritty realism, involving a computer scam that could really happen. Stir in some great computer sleuthing, and the end result is an admirable novel." - COMPUTERWORLD, June 14, 1982. Yourdon has woven a fine description of computers and their capabilities into this suspenseful story about computer crime, a missing person, greed, love, ruined dreams, and new starts in life. **Hardcover; 184 pages; ISBN: 0-917072-28-6; $13.95, including shipping and handling.**

IBM Upgrades Two MCCUs, Enhances 3814 Switching System

RYE, N.Y. — IBM has announced two upgraded versions of its multi-system channel communications units (MCCU) that are said to control the transfer of data between loosely coupled processors located up to four times farther apart than with previous IBM models.

At the same time, it also unveiled an enhancement of its 3814 switching management system.

The Model 3088 MCCUs are standalone, microprocessor-based devices that are designed to interconnect IBM 4341, 30 series, 3042-2 attached processor and 3081 channels while reportedly maintaining compatibility with existing channel-to-channel adapter features. The Model 1 MCCU can link four processor channels and provides up to 126 channel-to-channel paths; the Model 2 connects up to eight channels and offers as many as 252 channel-to-channel paths.

Both models transfer data at speeds up to 3M char./sec. Processors can be located as far as 800 feet apart, which is up to four times the maximum separation possible with current fBM channel-to-channel adapters, an IBM spokesman said.

Improved Features Offered

The MCCUs also offer improved diagnostic and service features, including automatic error detection and fault isolation, he said.

The Model 1 costs $95,000, while the Model 2 is priced at $f45,000. Shipments are scheduled for the second quarter of 1983.

Enhancements to the Model 3814 switching management system include support for more displays and printers, an increased capability to store and activate system configurations and the ability to link a second switching system to act as a backup.

Up to two IBM 3278 Model 2 display stations can be used as operator consoles with the enhanced system, the spokesman claimed. With these terminals, operators can display selection menus, audit trail data and entry and command panels.

Users can also attach as many as three fBM 3287 Model 1 or 2 printers to provide a record of stored configurations, configuration change data or switching operations, he noted.

The enhancements reportedly allow users to store as many as 464 crosspoint, or channel group, configurations. This compares with only 78 such configurations with the current 3814. In addition, up to 327 two-channel switch (TCS) configurations, defining the setting of all switches on a control unit such as an fBM 3880, can be stored in the 3814. Previously, seven TCS configurations could be stored, the spokesman said.

The enhancement also allows users to attach a second 3814 on the same system loop to be used as a backup device.

The enhancements that allow users to attach additional display stations and printers or use a second 38f4 device as an alternate cost $1,990 each. They can be rented for $85/mo or leased for $68/mo each.

The expanded storage enhancement costs $4,800. However, it can also be rented for $200/mo or leased for $160/mo under a four-year agreement.

Deliveries are scheduled for the first quarter of 1983, the IBM spokesman said.

IMS & CICS Standards

Implement your standards quickly and inexpensively.

Our IMS and CICS Standards packages allow you to avoid the time consuming and costly delays typically encountered when developing your own data base and data communication standards. Based on our experience with several clients, your standards can now be developed within just eight weeks and for approximately 20% of the cost of doing it on your own. Plus, our Standards packages enable you to implement your applications in a standardized, consistent fashion.

Our Standards packages include a comprehensive manual tailored to your individual environment and cover the full spectrum of application development from design to programming and implementation.

At DBMI, we understand the problems and frustrations of dealing with data base/data communication technologies. Since our inception in 1973, we've specialized in the design and development of a variety of distributed, on-line data base systems for clients in many different industry groups.

For more information, please call Jim Walton at (203) 646-3264.

We make every bit count.

DBMI

Data Base Management, Inc.
281 Hartford Turnpike, Vernon, CT 06066

Computer to Pit Koufax Against the Sultan of Swat

(Continued from Page 1)

some buddies at the St. Louis-based BFV&L Promotions, Inc. has turned into a 160-hour project involving three people and an Apple Computer, Inc. Apple III personal computer. Weber and his friends were wondering how the great players of the past would fare against modern competition.

A couple of weeks later, they were working on a project requiring statistical data to formulate different situations and, *voila*, the two projects collided. "We said, 'Wait a minute, wouldn't it be neat if we could do what we're doing here with baseball?' " Weber recalled. "So then we started pursuing the idea."

They sought out the historical information they needed from the archives of *The Sporting News* and decided to judge each player on his five best statistical years. The end result was 2M bytes of Apple Pascal data stored on a Winchester disk drive.

"We tried to create as realistic an environment as we could by getting as broad a statistical base as was feasible," he said. From there they developed a program that would give the most realistic outcome based on the statistics.

Even the most diligent baseball aficionado may be hard-pressed to remember Philadelphia's Schibe Park but, as Weber explained, it is historically appropriate. Formerly known as Connie Mack Stadium, Schibe has housed teams from both the American (Philadelphia Athletics) and National (Philadelphia Phillies) Leagues. The park was also a suitable venue because its symmetrical shape gives no advantages to left-handed or right-handed hitters.

No Bases Left Unturned

BFV&L left no bases unturned in its quest for realism. For starters, it hired veteran sportscasters Jack Buck and Lindsay Nelson to call the game based on the computer readouts. It also spent the first few months of the current baseball season recording sound effects at a host of big league ball parks to back the announcers. Finally, it asked the fans to vote on starting lineups.

The response was impressive. More than 116,000 fans cast ballots, which were distributed by radio stations and *The Sporting News*. The top voter was none other than The Yankee Clipper, Lou Gehrig.

In a contest that required a recount, former Yankee Phil Rizzuto, who now broadcasts Yankee games, beat out ex-Boston Red Sox Luis Aparicio by 15 slim votes. Holy cow.

Buck and Nelson actually called the "game" on June 21. Weber made sure that neither the announcers nor anyone else would know the eventual outcome by manufacturing multiple endings. That means only an inner sanctum of Weber and four others have that knowledge.

"We didn't want the final score known, and we didn't want Jack and Lindsay besieged as obvious people who would know the final outcome," Weber said.

What we do know is that weather conditions for the game were ideal, runs were scored in at least four innings, the final score was a close one and a capacity crowd of 32,408 packed old Schibe Park for the event. Total elapsed time was two hours and 35 minutes.

Casey Stengel managed the Americans and John McGraw the Nationals. According to Weber, they were selected for their colorful personalities. The umpires were Tom Connolly, Jocko Conlon, Bill Klein and Bill McGowan; a pugnacious lot if ever one existed. Disappointingly, Weber predicted no colorful rhubarbs.

The starting lineups in batting order:

American League: Phil Rizzuto, shortstop; Ty Cobb, center field; Ted (The Splendid Splinter) Williams, left field; Babe Ruth, right field; Lou Gehrig, first base; Rod Carew, second base; Yogi Berra, catcher; Brooks Robinson, third base; and Whitey Ford, pitcher.

National League: Pete Rose; first base; Mike Schmidt, third base; Stan Musial, right field; Henry Aaron, left field; Willie ("Say Hey") Mays, center field; Rogers Hornsby, second base; Honus Wagner, shortstop; Roy Campanella, catcher; and Sandy Koufax, pitcher.

Vendors Plant Software Traps

(Continued from Page 7)

According to reports in the general press, William England of England Software in Washington, D.C., also ascribes to the above methodologies. Because he suspected that a customer would not pay, he encoded a software "time bomb" in an environmental control program he developed for the client's Digital Equipment Corp. PDP-11. If payment was not made in the agreed upon 30 days, the booby trap would automatically stop the system from running.

Although England had warned the client, "the guy didn't believe me — he kept promising me a check, but it never arrived," he said, according to a report in the May 31 issue of *Business Week*. The software time bomb went off, shutting down the customer's heat and air conditioning and water-temperature-control systems. "He telephoned, frantically screaming at me because the program wasn't working and he was losing $3,000 a day because of it," the *Business Week* report continued.

After the client made good on his debt, England restarted the program. "If I weren't clever, I would have been stuck — not him," England reportedly said.

England is working in Moscow and could not be reached for further comment.

Correction

In the Micronotes section [CW, June 21, June 28], the incorrect address was used for Condor Computer Corp. The firm is located at 2051 S. State St., Ann Arbor, Mich. 48014.

Washington Update

Congress Gives Approval To Small-Firm R&D Bill

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Congress has completed action on the Small Business Innovation Development Bill, which mandates a 1.25% set-aside for small companies of the research and development budgets of most of the largest federal agencies.

Final approval of the legislation came June 29 after the Senate agreed to accept amendments to the bill made by the House of Representatives when it passed the measure one week earlier [CW, July 5].

The bill had been unsuccessfully opposed by the American Electronics Association, which argued the mandatory set-aside would be an unnecessary, additional layer of federal bureaucracy for the government's R&D programs.

CSC to Appeal Decision Reinstating Fraud Charges

WASHINGTON, D.C. — Computer Sciences Corp. (CSC) said it will appeal the recent decision of a federal appeals court in Richmond, Va., to reinstate a federal indictment charging the firm with fraud in connection with a large government DP services contract.

The company will be seeking a rehearing by the full appeals court on whether last year's dismissal of the indictment should be reinstated. A three-judge panel of the court reinstated most of the 1980 indictment against the company, several former and present CSC employees and a subcontractor on June 16 [CW, June 28].

The indictment resulted from allegations concerning CSC activities in obtaining and billing for a contract between the government and the firm's Infonet Division, which provided the bulk of federal agency teleprocessing services between 1972 and 1977.

Federal Agencies Issue Studies, Reports on DP

WASHINGTON, D.C. — Various federal agencies have recently announced the availability of several reports and studies of interest to the DP community:

• The National Telecommunications and Information Administration has published a primer entitled "The Discreet Logarithm Public Cryptographic System," which presents the required mathematics for such systems. The system's resistance to cryptanalysis is considered and advice is provided on architecture of system implementation and the tools that may be used, the agency said.

The report, No. PB 82-130097, is available for $7.50 from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

• A data base of information about existing computer software tools, compiled over a three-year period, has been analyzed by the National Bureau of Standards (NBS) in terms of tool classes and characteristic features.

Published as "Software Development Tools," the data base includes information on the availability, capabilities, limitations and applications of more than 360 software tools. Trends in the development and use of software tools are analyzed and discussed, the agency said.

The report is available for $6.50 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, order No. 003-003-02389-2.

• A survey of software validation, verification and testing (V,V&T) procedures at five government and five commercial sites has been conducted for the NBS by a Boeing Computer Services Co. team.

NBS said study investigators found "a general lack of awareness of V,V&T concepts and principles and only sparse and informal applications of V,V&T practices."

"A Survey of Software Validation, Verification and Testing Standards and Practices at Selected Sites," No. PB #82-209172, is available for $13.50 from the National Technical Information Service, Springfield, Va. 22161.

GAO Slams Army Corps For Poor DP Planning

WASHINGTON, D.C. — The Army Corps of Engineers has been criticized by the General Accounting Office (GAO), the congressional investigating agency, for "weak planning and control" of the Corps' information resources.

Charging the Army agency with "ineffective and inefficient management, acquisition and use" of those resources, the GAO said the Corps' major hardware replacement program is experiencing costly delays because of inadequate management.

Noting that program has an estimated life-cycle cost exceeding $1 billion, the congressional auditors recommended a more comprehensive planning process and a formal oversight mechanism for the Corps' DP acquisitions and use. The Corps answered the GAO report by saying it agreed in general, but disagreed on some details. The Corps also indicated it has begun making some of the management changes suggested by the GAO.

FDR™

AUTOMATIC BACKUP AND RECOVERY

INCREMENTAL BACKUPS
- Cyclic Backups—Only Dump Changed Data Sets
- Automatic Tracking of Backup Tapes
- Full Tape Utilization
- MSS Staging
- ABR will Pre Allocate Data Sets to be Restored
- TSO Remote Queuing
- SU60 Type Mods Available for VSI & OS
- Stand Alone Restore

ARCHIVING
- Based on Last Reference Date, User can Establish a Criteria for How Long a Data Set Should Remain on Disk Without Being Used
- Eliminate Unused Data Sets
- Enforce Data Set Naming Conventions
- Enforce Password and RACF Protection
- ABR will Automatically Backup and Scratch Data Sets off Disk and Keep Track of the Data Sets in its Own Data Base

DASD MANAGEMENT REPORTS
- Complete Backup Reports
- Unused Data Set Reports
- Invalid Data Set Name Reports
- Archive Data Set Reports
- Scratched Data Set Reports
- Simulation Reports
- Wasted Space Reports
- TSO and Batch Oriented Reports

Proven Record of Reliability

For Further Information or Free 30 Day Trial, Call or Write...

INNOVATION DATA PROCESSING
970 Clifton Avenue, Clifton, NJ 07013 • 201—777-1040

Available for IBM OS, VS and MVS.
Send for Free Poster

Filing Gives Details on ABI

BOCs to Continue Terminal Support Until '84

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Although American Bell, Inc. (ABI) — the subsidiary recently formed by AT&T to offer unregulated products and services — may begin marketing new business terminal equipment next January, maintenance and relocation of in-place systems will continue to be handled largely by Bell operating companies until July 1984. ABI will take over these chores after that date.

This was one of several operational details discussed in a capitalization plan for ABI that the phone company recently filed with the Federal Communications Commission (FCC).

Historically, Bell terminal products and many of its communications services have been marketed by the Bell operating companies under tariff.

Under AT&T's recently filed plan, however, the Bell operating companies will continue to market new terminal equipment only until their equipment inventories, as of next Jan. 1, are exhausted.

"Computer II"

Formation of ABI was precipitated by the FCC's 1981 Second Computer Inquiry Decision — generally referred to as "Computer II" — which inaugurated the policy of marketing terminal equipment as well as "enhanced" (computer-based) services on a deregulated basis.

As part of this same decision, AT&T was told that it could market such items only through a "fully separated" subsidiary.

The legality of the FCC decision is now being contested by the Computer and Communications Industry Association (CCIA), as well as other groups in a case being tried here before the U.S. Court of Appeals.

According to the capitalization plan that AT&T filed with the FCC, ABI's basic mission is to market terminal systems and computer-based products and services to business and residential customers. Its national marketing headquarters will be in New Jersey.

Related engineering, design and development work will be performed in-house at facilities located in New Jersey, Colorado and Indiana.

"Certain other engineering, design and development services will be provided by Bell Telephone Laboratories," the company reported.

"The development of custom-designed integrated circuits" was cited as an example of the work that ABI expects to farm out to Bell Labs.

ABI business systems products will be purchased from Western Electric Co. at "compensatory prices," AT&T said, adding that Western Electric may also sell such products on its own.

Furthermore, Western Electric will be free to "distribute, install and repair the products it sells to American Bell; provide engineering, design and development services; and license its technology," in accordance with Computer II requirements.

AT&T Proposal

AT&T is proposing to invest $4.7 billion in cash and equipment in ABI by 1985. The first contribution, due Jan. 1, will involve the transfer of assets worth a total of $158 million. The assets — buildings, land, machinery and furniture — include $34 million in computer equipment.

Bell operating companies will supply $88 million, while Bell Labs will supply most of the rest.

In addition, AT&T will provide a short-term $8 million loan and Western Electric will contribute a consumer products inventory worth another $8 million.

The second capital infusion — amounting to $280 million — is due July 1, 1984 and will be used to "provide for installation and maintenance of all Bell system business [terminal] systems," the company said.

WIP Speakers To Talk on Bell

WASHINGTON, D.C. — Anne P. Jones of the Federal Communications Commission (FCC) and Louise Lynch, chief executive officer of Courtesy Associates, will address the Washington Forum of Women in Information Processing (WIP), slated to take place here on July 22.

The two women will address the subject of AT&T's change from a utility to a competitive supplier; the role of the FCC in controlling growth and change in the communications industry; the significance of the Second Computer Inquiry Decision, which called for the deregulation of all customer premise equipment and a wide range of enhanced services; and how these issues impact the consumer.

Preregistration for this event is $15 for WIP members and $30 for nonmembers. Further details can be obtained from the WIP Seminar Series, 1000 Connecticut Ave. N.W., Washington, D.C. 20036.

No other copier

Only the new IBM Series III Copier/Duplicator Model 60 has all these features: a document feeder that automatically feeds up to 50 pages...

...as well as semi-automatic document feed for producing just a few copies...

...as well as "two-up" copying which automatically reduces and copies two pages onto one side...

...as well as job interrupt which allows small jobs to interrupt big jobs...

The new IBM Series III Copier/Duplicator Model 60

Our new copier creates top quality copies in combinations and configurations beyond your most productive dreams.

And it does it *fast*. Because the IBM Series III Model 60 performs tasks at the press of a button. And at the press of several buttons, it can even *combine* tasks.

If you like, you can start with just a few of these features and have the option of adding automatic document feed, or reduction, or *both* at a later date. Right in the office.

Terrorism Vexing International DP Crime Experts

By Jim Bartimo
CW Staff

LOS ANGELES — Smuggling, terrorism and sabotage by computer are a few of the potential crimes currently worrying experts in international computer crime, according to Jay Bloombecker, director of the National Center for Computer Crime Data.

If a computer criminal accessed a French computer from the UK and instructed the company to transport inventory to Brazil where he could claim it, which country would prosecute him if he was caught?

The answer is that there would be considerable confusion because of the state of international extradition laws, Bloombecker said in a recent interview, but the UK would most likely be able to prosecute. So the criminal could conceivably select the nation with the most lenient computer crime laws from which to access another country's computer.

Terrorists with data communications expertise could pose another problem. "It strikes me as unlikely that bombs will be the way to sabotage computers," Bloombecker said. "The motivation to use computer knowledge against the establishment is there. Terrorists will find the computer an attractive target. We haven't handled terrorism very well in the past and this won't get any better with the introduction of the computer."

As the number of people with computer knowledge increases, so will the incidence of international computer crime, especially crimes using remote-access terminals. High-technology theft and data piracy are other problems that could become commonplace as the users of remote terminals "capitalize on national boundaries," Bloombecker said.

100,000 Sites

"There are more than 100,000 computer sites in the U.S. and Western Europe alone that are constantly talking to one another — transferring funds, transmitting critical data and sensitive personal and diplomatic information," according to Barry Schrager, president of SKK, Inc., a systems software and consulting firm. SKK co-sponsored with Racal-Milgo, Inc. a conference on international crime titled "Operation Safeguard."

"In addition to main computer sites, there are several million computer terminals with the ability to access mainframe computers," Schrager said. "The opportunity for computer crime is, therefore, enormous."

The first step in eliminating this opportunity is to look at the kinds of crimes that are being committed now, Bloombecker said. The next step is to create a model law that can be applied internationally.

The National Center for Computer Crime Data has worked with the international police agency, Interpol, and local police forces to encourage the creation of a model law. Unless extradition laws are improved through an agreement made among nations, computer crime will rise as quickly on an international basis as it has in the U.S., Bloombecker said.

Expert Identifies Crime Scenarios

LOS ANGELES — There are seven scenarios for international and localized computer crime, according to Jay Bloombecker, director of the National Center for Computer Crime Data. Identifying the types of crimes that occur nationally and internationally is the first step toward stopping them, he explained in a recent interview (see story above).

The scenarios include:

- **The Playpen** — Wheo a computer crime is committed as the result of an experiment by a mischievous computer expert. This type of offense is often seen in colleges where students may tap into a file containing grades, Bloombecker said.
- **The Cookie Jar** — This is, perhaps, the most common scenario — found when someone is in need of a large sum of money and has access to a computer handling the accounts of a company.
- **The Land of Opportunity** — Even when there is no financial need, a computer expert may be tempted by the ease with which he may extort funds.
- **The War Zone** — A computer operator who feels that his employer has cheated him in some way may take revenge by sabotaging the company's data.
- **Fantasyland** — There are times when the person committing a crime is not totally aware of what he is doing. Through the influence of someone more knowledgeable, computer operators have been tricked into aiding criminals
- **The Toolbox** — A computer is as valuable a business tool when the commodity is drugs or other illegal inventory. Bloombecker believes that a more sophisticated crime ring may use a computer as a means to more efficient law-breaking.
- **The Soapbox** — When a terrorist group or other organization has a point of view it wants to receive public attention, it may sabotage a computer instead of kipnapping the head of the company.

can copy this.

...as well as manual document feed for making copies from bulky items such as books...

...as well as automatic duplexing which lets you copy on front and back...

...as well as a large document feeder that can take a 17" document and reduce it to 8½" x 11"...

...as well as a collator that is available in 20- or 40-bin sizes, with each bin able to hold more than one report.

And should you need service, it's available from IBM.

We've even added a feature that automatically helps us keep the Series III Model 60 running smoothly and productively.

For additional information, call your local IBM office. Or to arrange for a free demonstration, call the toll-free number listed below.

And find out more about a copier that really is an original.

IBM

800-631-5582 Ext. 155
In Hawaii/Alaska, 800-526-2484 Ext. 155.

Computerized Editing Cuts Costs of Publishing Thomas Jefferson's Papers

I am not afraid of new inventions or improvements, nor bigoted to the practices of our forefathers . . . Where a new invention is supported by well known principles, & promises to be useful, it ought to be tried.

— Thomas Jefferson

By Marguerite Zientara
CW Staff

PRINCETON, N.J. — The inventor and scientist Thomas Jefferson would doubtless have approved of the computerized editing of his political papers using a method expected to save $12,000 per volume in production costs.

The project was begun in 1943 as part of the Jefferson Bicentennial Celebration. Proposed by historian Julian Boyd, editor of the papers for 40 years at Princeton University, the project moved slowly after the 1950 publication of the first volume of Jefferson's papers.

By 1980, when Princeton historian Charles Cullen took over after Boyd's death, only 19 volumes had been printed. Volumes 20 and 21, due this summer, will bring Jefferson's edited correspondence up to the year 1791, when he served as George Washington's secretary of state. Besides more than 50,000 letters to and from Jefferson, the papers consist of other documents that together are expected to fill some 65 volumes when the project is completed sometime early in the 21st century.

Part of the reason Cullen was chosen to fill Boyd's position was his growing familiarity with computers. At the College of William and Mary in Williamsburg, Va., Cullen had used an IBM 370 processor to compile a cumulative index for the papers of Chief Justice John Marshall, the man who established the precedent of judicial review of the Constitution.

At Princeton, a bisynchronous communications line connects an IBM Series/1 and a Model 3081 computer. "Ninety percent of the time we actually work in the Series/1 on files that are stored on disk," Cullen explained, noting that about two volumes of material, or about 1,400 pages, can be stored on a disk.

Through this equipment, there are three methods of operation available to the scholars. "We can either send a file from the Series/1 to the 3081, or we can receive a file from that mainframe, or we can use 'pass-through' to pass through the Series/1 to work directly in the mainframe emulating a 3277 full-screen editing terminal," Cullen explained.

Historian Charles Cullen, working beneath a bust of Thomas Jefferson, is using an IBM Series/1 linked to a 3081 in his 25-year project of editing Jefferson's papers.

Cullen enters and edits text via an IBM 4978 terminal. Using the University of Waterloo's Script software — "an excellent formatting program," according to Cullen — the 3081 then arranges the material exactly the way he wants it to appear on the printed page.

The Series/1's "very new" Text Entry & Edit program "still has a bug in it that's really driving us crazy," Cullen said. "The programmer who wrote the program for IBM is trying to correct the problem now."

In the meantime, the program "doesn't end properly," according to Cullen. "The bug is in the Receive part of the program that enables us to receive files from the mainframe into the Series/1. The program drops off the last block of data, which is of course a nuisance, because when we receive programs we have to put a fake block of data at the end of each file.

However, "when it works, it works beautifully."

What exactly takes so long? Basically two things, according to Cullen: "ensuring the accuracy of the transcription we make from Jefferson's handwriting, . . . which might involve looking at an enlarged portion of a letter to see it more clearly or looking at the originals in the Library of Congress, and the research necessary to annotate the documents to explain things that are mentioned in them."

AMER-CAL INC.

PRESENTS

MANTIS* EDUCATION THAT WORKS

Amer-Cal Inc. has developed the education courses you need to realize the performance gains made possible by MANTIS*. These courses concentrate on the techniques necessary to take full advantage of the fourth generation technology and prototyping capabilities of MANTIS*. All courses are taught in a "hands on", workshop environment, taking case study applications from inception through implementation.

1982 CLASS SCHEDULE
(Limit - 6 students per class)

Class I MANTIS - Concepts & Techniques	Class II MANTIS - Advanced Screen and File Techniques	Class III MANTIS - Table Handling Techniques
July 12-16	July 19 - 20	July 21 - 22
August 9 - 13	August 16 - 17	August 18 - 19
September 13 - 17	September 20 - 21	September 22 - 23
October 11 - 15	October 18 - 19	October 20 - 21
November 8 - 12	November 15 - 16	November 17 - 18
December 6 - 10	December 13 - 14	December 15 - 16

For more information call (312) 398-4700. Ask for Education Coordinator

or write

AMER-CAL, INC. 115 E. UNIVERSITY DRIVE, ARLINGTON HEIGHTS, IL 60004

*CINCOM SYSTEMS POWERFUL FOURTH GENERATION LANGUAGE

Does Your Company Produce Catalogs?

We'll Cut The Size, Weight, Delivery Time and Cost!

Catalog Produced by Conventional Printer the old way

Same Catalog Published by O'Neil Data Systems

IF YOUR COMPANY PRODUCES PRICE CATALOGS, inventory lists, parts manuals, schedules, internal telephone directories, library catalogs, reference and instruction material, membership or registration lists, we can save you substantial money and delivery time.

If you have large numbers of items in a computer you need to print and distribute on a recurring basis, **JUST SEND US A MAGNETIC TAPE AND WE'LL DO THE REST:**

- Innovative catalog redesign and data organization. Reduction of weight, space and number of pages. Format changes and error corrections. Automated printing and fast mailing to your distributors or mailing lists. In the example above, $1.71 per book is saved alone on 1st Class Postage between Los Angeles and Chicago.
- Your product will look better and be easier to use. You'll save even more money because our shorter delivery time gets price changes to your dealers faster. (Time means Big Money during inflationary periods.)
- You will avoid delays and headaches related to internal priority and approval problems when you want to make changes to your catalog. Changes that require your computer staff to alter their programs. We have 12 Systems Programmers and make such changes in a few hours.
- O'Neil Data Systems has two large scale computers driving Advanced Computer Output Microfilm and Phototypesetting equipment plus our own automated printing facility; all on the premises. We don't ship out or subcontract any phase of your job. This means we do your job faster and at less cost to you.
- **WHOSE CATALOGS DO WE PUBLISH?**

Beckman Instruments, Inc.
BMW Motor Co. North America
Burroughs Corporation
Computer Sciences Corporation
Walt Disney Productions
Fiat Motors of North America
Foremost McKesson, Inc.
General Dynamics, Convair Div.
American Honda Motors Co., Inc.
Kahan & Lessin Co.
Kawasaki Motors Corp., U.S.A.
NASA/AMES
Department of the Navy
Pacific Telephone and Telegraph
Peterbilt Motors Company
Real Estate Digest
San Diego Unified Schools
The Service Bureau Co. (Control Data)
Telecredit, Inc.
Toyota Motor Sales, U.S.A., Inc.
United Stationers
University of California
U.S. Suzuki Motor Corporation
Volkswagen-Porsche-Audi
Volvo of America Corporation
Yamaha Parts Distributors, Inc.

WHY NOT LET US BID ON YOUR NEXT PRINTING CONTRACT?

Tell me more about saving money and time with your Faster 4-Day Service.

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip _____
Phone _____

O'NEIL DATA SYSTEMS, INC.

2005 Armacost Avenue • Los Angeles, California 90025 • Telephone: 1/213/820-4247

JUST SEND US A MAGNETIC TAPE — WE DO THE REST!

Houston Agency Stops Paying for Its 370/138

HOUSTON — Because of a 20% cut in subsidies by the U.S. Department of Housing and Urban Development, the Houston Housing Authority (HHA) has not made a payment on its IBM 370/138 mainframe since last December.

The funding cut is the primary reason why the HHA can no longer meet its monthly $10,000 payments, according to newly appointed HHA Board Chairman H.J. Tollett Jr. However, sources close to the HHA argue that regardless of payment, the equipment is underutilized.

The equipment was originally ordered from IBM in 1978. When IBM could not deliver the computer fast enough, it was purchased in 1979 from a local supplier, Computer Sales International, Inc. (CSI), to maintain the HHA's financial records and rent subsidy payment schedules. Since then, every member of the HHA board has been replaced or resigned "for no particular reason," Tollett claimed.

Although the board has changed, a financing contract for the equipment with E.F. Hutton Co. remains in force. The contract calls for the agency to make payments totaling $688,400 when the contract expires in February 1985, according to E. Richard Makowski, a spokesman for E.F. Hutton.

Although in recently published reports Makowski has been critical of the HHA's decision to suspend payment for the equipment, when contacted recently he would make no comment pending negotiations with the new board.

In addition to not meeting the payment schedule with E.F. Hutton, the HHA has no computer-trained personnel to operate the data processing department properly, according to a report published in the *Houston Post*. "I have no doubt it was the machine for them [HHA]," Al Smith of CSI said, "but they can't run it with two people."

Plans to obtain a new computer system are in the works. "We're starting from scratch," Tollett said.

Tollett agreed that there is a personnel problem in the HHA, but said he is too new in his position to predict any changes. The agency's acting executive director, Joy Fitzgerald, would make no comment on the board's history or the use of the computer.

Why has the HHA stopped paying for the system? "The funds are not available," according to Tollett. "That thing costs too much. It costs us $400,000 per year when you include software, maintenance and other costs."

Student Gets Fine, Probation For DP Scheme

By Susan Blakeney
CW Staff

PHILADELPHIA — Daniel J. Smith's let's-make-a-deal scheme won him a $300 fine and two years of probation after he offered to bypass security checks in Philadelphia's Office of State Inheritance Tax computer system — for a price.

The Princeton University co-op student said he was "bored" working part time at the State Inheritance Tax Bureau last summer when he decided to write to five lawyers offering a 50-50 deal. According to the deal, Smith would use the department's computer system to reduce or mark "paid" the tax records of the lawyer's client.

The payoff, according to court records, would have netted him approximately $5,000.

But "Smith was promising something he could not have delivered," Richard Papiernik, press secretary for the Department of Revenue, said. Taxes are not paid directly to the Office of State Inheritance Tax, but go through the Department of Willa first.

Smith "had a minor position — he was not even involved in the money collecting end," Papiernik contended. "He did not have access to the main computer.... All he did was check statistics on tax collection."

Smith did have access to a terminal in his work area, Papiernik said, but he worked primarily on computer printouts and could not access the department's main files on an IBM 3033 mainframe. "Not only would he have had to access our main file, but he would have also had to change the numbers on a report from the Registry of Wills Office that matches up debts and payments."

Smith was caught when Paul Bartle, one of the lawyers to whom he wrote, turned his letter over to his brother, Harvey Bartle, then Pennsylvania's attorney general, who launched an investigation.

On March 11, Smith pleaded guilty to charges of bribery and obstructing administrative justice. Presiding Judge Anthony Scirica ordered psychiatric treatment as part of the plea bargain agreement.

"What does Lanier offer in service that the others don't?"

47 years ago, Lanier made a pledge. To provide the best service in the industry. To this day we haven't wavered from this commitment. In fact, Quantum Science rated our service number one in a 1980 survey of users. Number one. But it's no surprise when you know how thoroughly we train our Customer Service Representatives.

"How much training does a Lanier Customer Service Representative have?"

"Extensive training. Before applicants can even qualify they have to have had formal electronics training. They also have to take rigorous exams to prove their technical skills. Trainees then attend Lanier's intensive Service School where they learn about Lanier products and their peripherals."

"What do CSR's do to keep current with the state of the art?"

"They keep training. Lanier offers programmed learning courses to help CSR's keep up with industry technology. The more courses our CSR's complete, the more responsibility and recognition they receive. Lanier believes in rewarding outstanding performance. This approach results in more productive CSR's and more efficient service for you."

"How can I be sure Lanier will be there whenever we need service?"

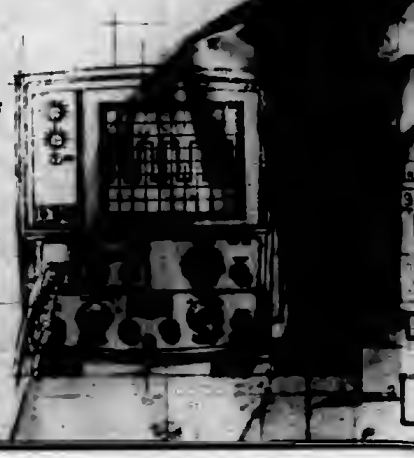
"We guarantee it. Our yearly service contracts include unlimited service calls. We'll be there in most cases within 4 hours. In addition, Lanier CSR's regularly perform preventive maintenance inspections. Whether or not you need service. Just to prevent problems from developing."

"How long does it take to fix the system?"

"We'll get your equipment up and running in no time. On every service call, our CSR runs a diagnostic test on your equipment, using a special Lanier Smart Disc.® This test quickly isolates any problems to one circuit board. After replacing the defective board, the CSR takes it back to a local service center for repair."

"What's this kind of service going to cost me?"

"Less than you think. Since the boards are repaired locally, Lanier doesn't have to maintain such a large circuit board inventory. That reduces our operating costs and we pass those savings on to you. You get quicker, more efficient service at lower cost."



© 1982 Lanier Business Products, Inc.

For Zip Code, Electronic Mail Services

Independent Evaluation Chides Postal Service

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — An independent evaluation of the U.S. Postal Service (USPS) released last week chided the Postal Service for inadequate planning and management in introducing new technology, such as the nine-digit Zip Code and electronic mail services.

The study, performed by the National Academy of Public Administration, said that in light of the increasing availability of computer and telecommunications technologies, the USPS "should devote considerably more systematic attention to assessing its opportunities for developing new and responsive services." The academy is a 15-year-old nonprofit organization established to study governmental problems and to advise public officials.

The evaluation report was not particularly laudatory of the way these new technologies have been introduced into postal operations and services to date. Of the Zip-Plus-4 program, which the academy called "an excellent step toward increased postal productivity," the report said: "Closer attention to potential public reactions and political attitudes will help USPS do better in . . . paving the way for . . . acceptance."

The report praised the USPS decision to begin offering electronic mail services, but suggested the agency should work to "improve its relations with the information industry and eliminate much of the misunderstanding concerning [USPS] intent."

The evaluation was undertaken at the request of the Postal Service to gauge its success at carrying out the mandates of the 1971 Postal Reorganization Act, which created the USPS as an independent government body. The 10-member evaluation panel included Dr. Ruth Davis, former director of the National Bureau of Standards Institute for Computer Sciences and Technology; Thomas Wands, former senior vice-president for operations at Sears Roebuck & Co.; and Elmer Staats, former U.S. Comptroller General.

The postal evaluation panel found that in general USPS management since reorganization constitutes a "record . . . of considerable achievement. USPS management has been aggressive and intelligent in tackling its problems through new methods, mechanization and training programs," the study concluded.

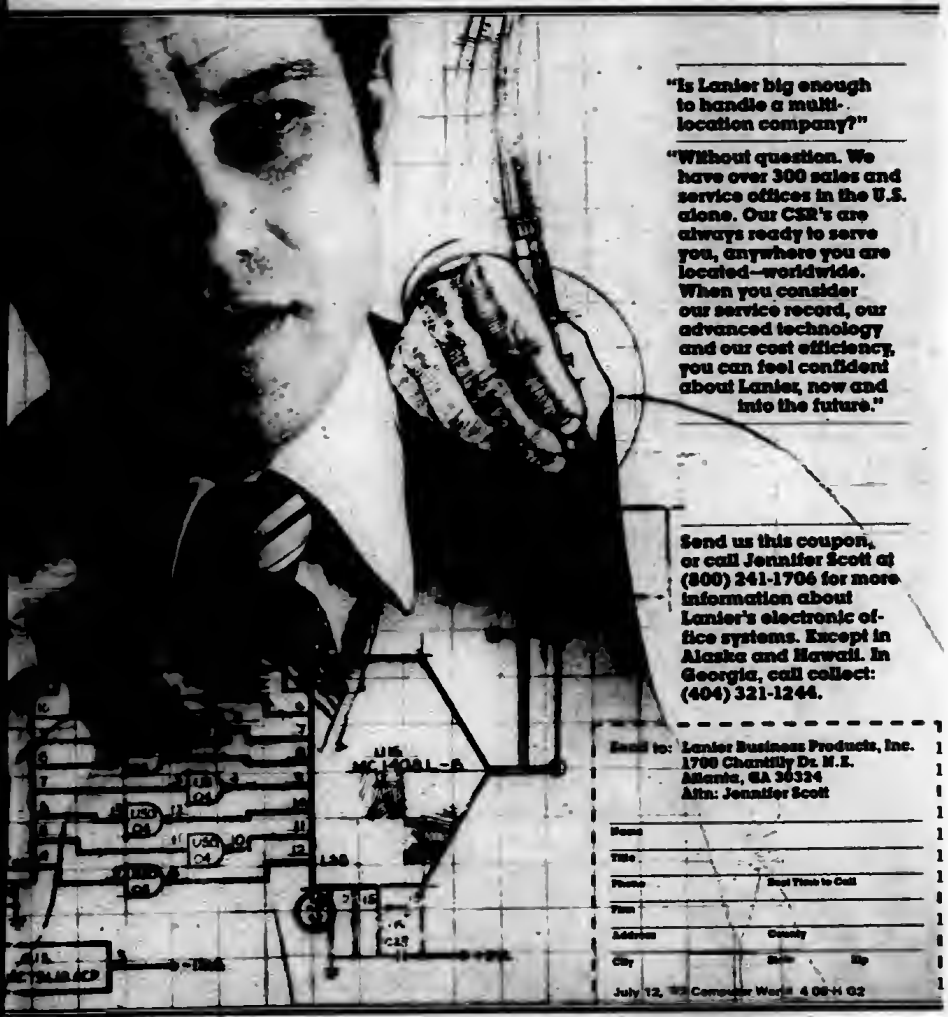
Looking to Future

However, looking to the future, the report said "planning, research and development in USPS have been deficient and should be substantially strengthened and improved." In the area of new technology, which threatens to supplant a portion of first class mail and diminish postal revenues, the Postal Service has not been diligent enough in tracking new services possibilities and measuring the future USPS market.

Turning to electronic mail in particular, the panel backed the recently established Electronic Computer-Originated Mail (Ecom) service. "USPS should make its plans for electronic mail services a high priority for early distribution and discussion" and work closely with Congress, regulatory agencies and the telecommunications industry to develop a widely acceptable Postal Service role in electronic mail, according to the academy.

USPS should "improve and diversify" its existing Ecom services, but should not attempt to offer point-to-point electronic message systems, the so-called "generation III services," the evaluation report said.

"A bigger commitment."
Joe Sensat, National Service Manager, Electronic Office Systems Division



"Is Lanier big enough to handle a multi-location company?"

"Without question. We have over 300 sales and service offices in the U.S. alone. Our CSR's are always ready to serve you, anywhere you are located—worldwide. When you consider our service record, our advanced technology and our cost efficiency, you can feel confident about Lanier, now and into the future."

Send us this coupon, or call Jennifer Scott at (800) 241-1706 for more information about Lanier's electronic office systems. Except in Alaska and Hawaii. In Georgia, call collect: (404) 321-1244.

Send to: Lanier Business Products, Inc.
1700 Chantilly Dr. N.E.
Atlanta, GA 30324
Attn: Jennifer Scott

Name
Title
Phone Best Time to Call
Firm
Address County
City State Zip

July 12, '82 Computer World 4 08-H G2

We'll change your mind about the future. Right here and now. LANIER

SNA Meet Set For July 26-28

ROSEMONT, Ill. — Practical applications, benefits and pitfalls related to IBM's Systems Network Architecture (SNA) will be presented during a three-day seminar here July 26-28.

The seminar, "SNA Architecture and Implementation," will also be held in San Jose, Calif., Aug. 16-18; Boston, Sept. 13-15; and again in San Jose, Nov. 15-17.

The seminar is being sponsored by Communications Solutions, Inc., which said it is aimed at network designers, systems programmers, technical managers, product planners, systems analysts, operations managers, marketing managers and others involved with SNA.

Emphasis will be placed on examples of how various protocols are used in existing SNA products to control end-user-to-user communications. SNA's impact on the user's communications environment, its relationship with standards such as X.25 and the International Standards Organization's reference model and its implications for non-IBM communications product vendors will also be covered.

The fee for the seminar is $650, Communications Solutions said from Suite 205, 10062 Miller Ave., Cupertino, Calif. 95014.

Robots to Dominate Manufacturing

ADL Gurus Explore DP's Industrial Impact

By Tim Scannell
CW Staff

CAMBRIDGE, Mass. — By the end of the decade, computers will dramatically shrink the size of the average factory and reduce overhead labor; turnkey robots will dominate industrial environments; and artificial intelligence will revolutionize the medical field.

By 1990, the majority of industrial robots will be leased rather than bought, and computers, machines and people will be linked together in "real time" to achieve higher work quality, less waste and shorter production runs.

These are some of the findings that came out of a meeting last month of nearly 100 experts and analysts from Arthur D. Little, Inc. (ADL), a research and consulting firm based here. The industry and technical gurus traveled from various points of the globe to attend the firm's biennial forum that focused on the critical concerns and issues facing business and government leaders over the remainder of the 1980s. More than 200 executives from industry and government attended the four-day conference held at Boston's waterfront.

Significant Finding

One of the more significant — although predictable — findings of the meeting is that computers will play an increasingly important role in the so-called factory of the future. Computers will not only cut down on direct labor, but will reduce white-collar indirect labor, which has seen rapid increases over the past 25 years, according to Thomas G. Gunn, managing director of ADL's Computer Integrated Manufacturing Group (CIM).

Gunn pointed out that many U.S. operations presently have from eight to 14 layers of personnel between the chief executive officer and workers on the shop floor. Computers — especially robots — will reduce that gap by replacing many of the middle people and increasing the flexibility and flow of information between the bottom and top corporate rungs, he said.

Dr. Irvin Krause, an industrial specialist also with ADL's CIM group, echoed Gunn's views, adding that computer-aided design and manufacturing (CAD/CAM) systems will be more heavily used to direct programmable machinery and construct the final product. At the moment, most CAD/CAM equipment is used mainly in the design phase and has little to do with the last steps in the manufacturing process, Krause explained. In fact, while the U.S. first developed CAD/CAM and reportedly holds the lead in design technology, only 5% of the country's manufacturing tools are aided by computers. And many of these are imported from Japanese companies, the specialist maintained.

In addition, for all the ballyhoo about CAD/CAM, only 25% of its potential users have adopted it and very few are applying it properly, Dr. Leonid Lipchin, an ADL manufacturing specialist, said. CAD/CAM equipment is primarily used for automating routines and repetitive functions such as drafting and product design, he said. These actions even create "the undesirable side effects of more paperwork, more overhead and difficulty with job scheduling."

CAD/CAM's benefits on product cost and overall company performance really shine when the technology is used for product creation and the direction of the manufacturing process, he stated.

Focusing on robotics, Dr. Gerald J. Michael, a senior consultant with ADL's CIM group, forecast that the industry will soon see the evolution of robot leasing. In fact, by 1990 leasing industrial robots will account for a lion's share of the total U.S. robot market. However, this will only come with the development of high-level user-friendly robot programming languages to replace today's cumbersome techniques that teach a robot to do something by physically moving its parts, Michael noted.

ADL's research staff also exchanged ideas on a new technology that could revolutionize semiconductor manufacturing, and the effect computers will have on medicine.

Molecular beam epitaxy (MBE) is a technique that relys on ultrahigh-vacuum evaporation to grow single crystalline chip layers, not necessarily using traditional silicon. The crystal surfaces can then be coated with atoms and molecules to control the behavior of the electronic device. The technique could result in the development of devices that handle information up to 10 times faster than present silicon devices, Dr. Mehmet Rona, a senior physicist and director of ADL's recently completed MBE laboratory, said.

The medical profession will also benefit from the increased use of computers by using machines programmed to adjust their thinking and make decisions in response to new patient and physician information.

Introducing Hot Buttons.™

New extra-convenience features for terminal versatility.

We developed our new Model 16, 24-line x 80-column smart terminal to set a new standard in convenience. The result is Hot Buttons: exclusive design characteristics which provide unparalleled flexibility and operator authority.

A. Change the functions. Design the page.

Don't let your keyboard design dictate to you. Tell it what to do. Better yet, tell it what to be. For example, if you don't need the "↑" cursor control key, change the key function so that it becomes a "½". Or a "Σ". Or any other character, sequence or function. Any of the thirty-two keys in the top row or numeric pad (excluding the "STATUS" key) can be recoded to be any other key you prefer.

But, there's more. This new "user definable" characteristic also allows you to determine logical line and page length.

For the first time, you're master of both the keyboard and the display. Boss it around.

B. Clock yourself.

Tell the time, right from the terminal screen. This Hot Button feature provides accurate, digital printout of the time of day or elapsed time. Use it to keep a concise work log. Or just to keep your own important schedule. Time does pass, but with the Model 16, it doesn't have to go unnoticed.

C. Calculate the difference.

Add, subtract, multiply, or divide. Whatever your office calculator did for you before, the Model 16 Hot Buttons do for you now, with convenient display on line 25. Reduce work station clutter by eliminating the need for additional equipment. Keep accounting capability at your fingertips.

Comfort, flexibility and reliability.

That's what you really want in your terminal. And that's what Teleray's Model 16 delivers. You get all the innovative ergonomical and functional features of our previous models. Full editing capability. ANSI X3.64 compatibility. Plus four pages of display, horizontal and vertical scrolling capability, line and mosaic graphics, and Hot Buttons—unique characteristics that make our Model 16 the smartest terminal in its class. All standard. Designed for convenience. Designed for you.

Call or write for more information or a no-obligation demonstration. Phone 612-941-3300.

The Model 16 with **Hot Buttons.**
Push a few.

TELERAY
DIVISION OF RESEARCH INC

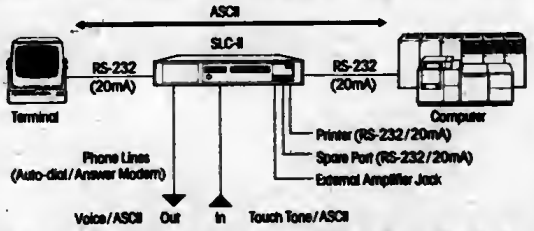
Let our SLC-II Robotic Communicator watch your unattended computer 24 hours a day.

If a problem arises, the SLC-II will warn you, accept commands, and act in seconds.

If you're responsible for an expensive computer, you still don't want to have to watch it 24 hours a day. That's a job for SLC-II. With our new robotic communicator doing the monitoring, you may never have to see your computer again.

SLC-II never sleeps, sees everything, and automatically does more jobs than you might imagine. Let it boot your system and tickle it from time to time to make sure it's alive, enter in date and time, and monitor all traffic from computer to console. In the event of trouble, SLC-II will automatically call and warn you by telephone, and take action based upon your command.

Whether you're monitoring snowfall in Alaska or managing a network communications station in Florida, your unattended computer needs SLC-II. It's so easy. There are no software changes to your system. And installation's amazingly simple.



For your own peace of mind, and so you'll never have to set eyes on your computer again, call or write: Digital Pathways, 1060 East Meadow Circle, Palo Alto, CA 94303. Telephone: (415) 493-5544. TWX 910-379-5034.

DIGITAL PATHWAYS

United States Headquarters: (415) 493-5544 • Eastern Regional Office: (301) 997-6886 • Canada: (403) 286-2744
England: 0403 813 813 • Germany: (089) 60 60 71-72 Telex: 5216290 isio d • Switzerland: 022/310587 Telex 289191

ANOTHER QWIKTERM SPECIAL

Diablo 630
only $2295
Letter quality printer, full blown with word processing enhancements
Three Month Leases Available

• Boston (617) 246-1665
• Chicago (312) 595-7733
• Los Angeles (213) 417-8003
• New York (212) 564-7731
• San Francisco (415) 461-0923
• Wash., D.C. (703) 522-1210

Course Starts Aug. 9

Class to Examine CPU, I/O Capacity

SUNNYVALE, Calif. — A course on establishing the capacity of computer systems will be given here Aug. 9-13 by the Institute for Software Engineering. The institute is an international organization specializing in providing education, publications and research in the field of capacity management to the data processing management and technical communities.

The five-day course on "Establishing Computer Configuration Capacity," was developed to assist performance analysts, systems programmers, capacity planners and other technical staff members in assessing the CPU and I/O capacity of computer systems. The course presents a detailed methodology for assessing the effects of contention on a variety of system components as well as the performance implications of combining and reconfiguring subsystems.

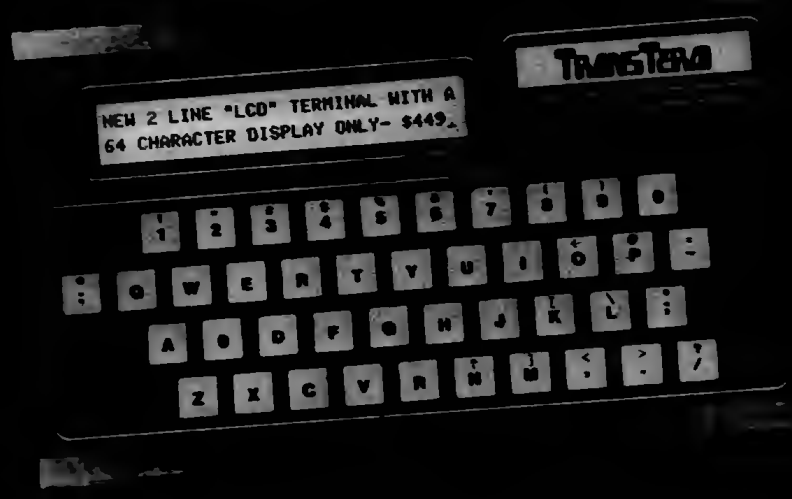
Attendees will be instructed on how to rate both CPU and I/O power in current and alternative configurations. Examples and exercises taken from actual case studies are an integral part of the course, a spokesman said.

The cost of attending "Establishing Computer Configuration Capacity" is $895 per person, with group discounts available. More information is available from the Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

$380. TERMINAL

100's
$449. SINGLES

The Biggest Little Deal in Terminals!



The TransTerm 1 is ideal for applications where low cost and minimum size or portability are desirable. The TransTerm 1 can be used on a horizontal desk-top surface or mounted on a vertical plane. Typical applications include:
- Dial-up data entry/retrieval
- Factory floor data collection
- Portable console terminal
- Microprocessor support device

- Data Formats - 7 Data Bits, Odd Parity
- Three serial selectable operating modes:
  - Teletypewriter Emulation
  - Block Send
  - Multidrop Polled
- 20 ma Current Loop Interface (optional)
- RS-422 Compatible Party Line (optional)
- Powered by Wall Plug-in Transformer
- Low Power Consumption (less than 16 watts 115VAC)
- 25 pin RS-232 Type Female I/O Connector
- Custom Configurations Available

COMPUTERWISE
4006 East 137th Terrace • Grandview MO 64030 • 816 765-3330

DG Meet Set For Aug. 30

WASHINGTON D.C. — The North American Data General Corp. Users Group Conference will be held here from Aug. 30-Sept. 2 at the Sheraton Washington Hotel here.

The conference will include a full slate of discussions and technical presentations by both DG and users of the firm's hardware and software.

More information on the users group conference is available from Kathy Hickey at Data General, 4400 Computer Drive, M.S. C228, Westboro, Mass. 01580.

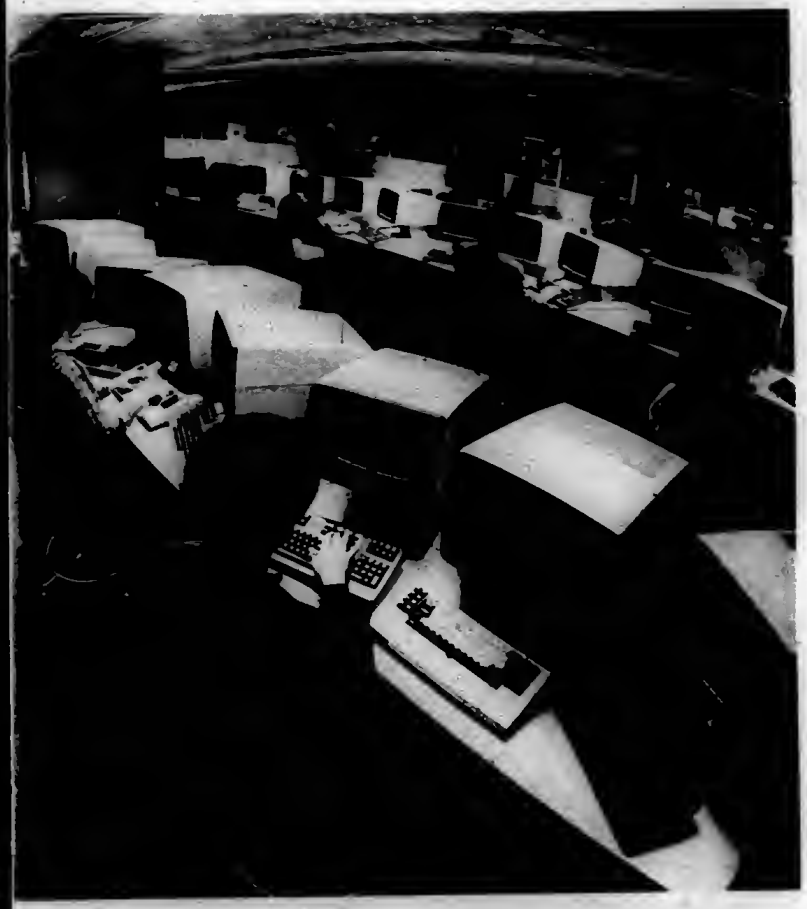
ACM to Sponsor Ada Seminar From July 19-23

COLLEGE PARK, Md. — A five-day seminar on "Programming in Ada," sponsored by the Washington, D.C., chapter of the Association for Computing Machinery (ACM), will be given here July 19-23.

Dr. George W. Cherry, technical director of Language Automation Associates, will conduct the course.

Topics to be covered include a history and overview of Ada; the lexical rules and units of Ada; various Ada programs; task synchronization and communication; built-in data types — arrays and records; Ada's 11 simple statements; and Ada's six composite statements, according to ACM.

The cost of the seminar is $300. Further details are available from Arthur Messenger at the Department of Defense Computer Institute, Washington, D.C. Navy Yard, Washington, D.C. 20374 or from the ACM P.D. Committee, P.O. Box 39110, Washington, D.C. 20016.



You have the information. We have the way to move it.

It's extraordinary how far American business has gone in managing information in the office.

And how frustrating it can be to get that information where it's needed, once it leaves the office.

Your computers, for example, can swap data with each other. But if you need to transmit that data to less sophisticated or incompatible equipment, you can't.

Our Communications Spectrum

It seems clear that something must be done to bring the movement of information outside the office to the same sophisticated level as inside the office.

Improving the movement of that information is precisely what we at ITT Worldcom are doing now with our Spectrum of Communications Services.

To put it simply, our Spectrum is a new range of worldwide information movement services. We've created it specifically to bring together the latest advances in data and record communications.

So, returning to our example, your computers and terminals are now able to talk to any other terminals, anywhere in the world. Even those on other networks.

Now throughout the U.S.

You can even deliver the same information to an unlimited number of terminals, automatically.

And we're continually adding new service features to our Spectrum with an eye to satisfying your future requirements.

The way we look at it, whatever other productivity problems American business has, it's producing more and more information.

And getting that information where it's needed speedily, reliably, efficiently and economically—that's what ITT Worldcom is all about.

I'd like more information. C7/82

My area of particular interest is in:

☐ Communications within the U.S.

☐ International Communications

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Marketing Department (A/PR)
ITT World Communications Inc.
67 Broad Street
New York, New York 10004

ITT

ITT World Communications Inc.

Managers on the Move

Gary T. Grimm

Mark Alyea

William M. Dellinger

Russell Apgar

Daniel Vujcich

GARY T. GRIMM has been elected assistant vice-president at Western Savings in Phoenix. He will continue to serve as the electronic data processing auditor.

Before joining Western Savings in 1980, Grimm was employed with Northern Arizona University as a DP auditor. He has also served as a systems manager with the Phoenix Department of Public Safety.

He is the founder and president of the Phoenix Metropolitan Chapter of the EDP Auditors Association. Grimm is also a certified information system auditor and a certified data processing auditor.

•••

MARK ALYEA has been promoted to vice-president of data processing at Alro Steel Corp. in Jackson, Mich.

Alyea joined Alro Steel Corp. in March of 1981 as director of data processing. Prior to joining the company, he was director of data processing at Erb Lumber Co. in Birmingham, Mich.

He graduated Oakland Community College with an associate's degree in business administration.

•••

WILLIAM M. DELLINGER has been promoted to manager in the management Advisory Service Department of Price Waterhouse and Co. in St. Louis.

Prior to joining Price Waterhouse, Dellinger served with Carolina Power & Light, Telex Terminal Communications and McDonnell Douglas Automation Co. in the areas of programming, analysis and consulting.

He received a B.S. degree in data processing from North Carolina State University.

•••

RUSSELL APGAR has been promoted to assistant manager of the Whippany Data Center of the Eastern Division of the Suburban Propane Gas Corp.

Apgar joined the company as a billing clerk at the company's sales and service center and prior to his promotion, was supervisor of data processing at Whippany.

He is secretary of Lakeland Chapter 221 of the Data Processing Management Association.

•••

DANIEL VUJCICH has been appointed assistant manager of systems and programming at CF&I Steel Corp. in Pueblo, Colo.

Vujcich joined CF&I as a counter-

(Continued on Page 22)

OEM EUROPE MEETS AT THE INVITATIONAL COMPUTER CONFERENCES

Seminars on the newest product technology — and "hands-on" displays of the latest computer and peripheral equipment for the quantity buyer are available to European OEMs at the Invitational Computer Conferences.

In Amsterdam, Milan and Munich this October, decision makers will meet manufacturers for "one-day-only" intensive coverage of mini/micro computers, disk drives, CRTs, tape drives, printers, interfaces, controllers, graphic display systems and other equipment. These international conferences are tailored exclusively to meet the requirements of the European OEM — region al locations are selected so extensive travel is not required; the seminars and displays are focused in purpose so there is no sorting through mountains of useless data, and the conferences are limited in size so in-depth coverage can be made in a single day.

Some of the companies displaying products in last year's series were: AED, Century Data Systems, Cipher Data, Data Electronics, Inc., Dataram, Fujitsu, Genisco Computers, Hewlett Packard, Kennedy Co., Micromation, Inc., Micropolis, Micro Peripherals, Inc., National Semiconductor, Pertec, Priam, Printronix and Remex.

Plan to attend the conference nearest your area. Invitations are available (without charge) from participating companies or from the ICC sponsor. For further information contact:

B. J. Johnson & Associates
3151 Airway Avenue, #C-2
Costa Mesa, CA 92626
Tel. (714) 957-0171
Telex: 678401 TAB IRIN
(or)
U.K. Office: Tom Lewis
Text 100 Ltd.
10 Barley Mow Passage
Chiswick, London, W4 4PH
Tel. 01 994 6477
Telex: 8811410 Ref.
T100N SPACES G

Invitational Computer Conference	Amsterdam	October 7,	1982
	Milan	October 13,	1982
	Munich	October 19,	1982
82/83 Schedule	London	March	1983
	Frankfurt	March	1983
	Paris	March	1983

Invitational Computer Conferences

why would a busy data processing professional go to graduate school on saturday?

To be better prepared for the challenges that come on Monday.

Fairleigh Dickinson University announces a weekend program leading to an MBA in Management (For Data Processing Professionals). On the weekend, when the business world slows down, an innovative graduate business administration program revs up at Fairleigh Dickinson University in Rutherford, New Jersey. The program, open exclusively to experienced and academically qualified data processing professionals, leads to an MBA degree in two years of study on Saturdays.

Data processing professionals with at least five years experience in the field take courses in five week modules. They progress through the program in a single group beginning in September or February, completing three modular courses each semester.

For an application and more information, mail the coupon today. Or phone the College of Business Administration, Rutherford Campus, at (201) 460-5345.

University Admissions
Fairleigh Dickinson University
150 Montross Avenue
Rutherford NJ 07070

Please send me an application and more information about the MBA in Management (For Data Processing Professionals).

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
BUSINESS PHONE _____
HOME PHONE _____

CW 7/12

No person acting within the scope of his or her authority, and responsibility at Fairleigh Dickinson University shall discriminate on the basis of race, color, creed, sex, national origin, handicap, military status, or age, except to the extent permitted by law.

fairleigh dickinson university
Florham-Madison Rutherford/Wayne Teaneck-Hackensack New Jersey

TI and GTE can deliver your mail in minutes.

Electronic mail is fast becoming a communications vehicle of the future. And now, Texas Instruments and GTE Telenet offer a practical solution that lets you take better advantage of this growing information medium. By using TI's *Silent 700** Portable Data Terminal, the subscribers of GTE Telenet's computerized Telemail† service get their information in minutes, not days.

Simply put, TI's Model 745 Data Terminal allows you to compose your messages in your office or on the road, then GTE Telenet delivers your electronic mail to any point in the network. You even have instant access to all your previous correspondence. Compared to conventional methods, it's one of the easiest and fastest ways to exchange information, nationwide and in over 40 countries worldwide.

The portability of our data terminal offers one big advantage. You can take it to any standard telephone and electrical outlet, plug it in, and you're in business. No matter where your business takes you.

So if you need instant information exchange, contact Texas Instruments, P.O. Box 202145, Dallas, Texas 75220; or phone 1-800-231-4717; in Texas, call 1-800-392-2860.

TEXAS INSTRUMENTS

TI Sales Locations in CANADA: BRITISH COLUMBIA: Vancouver; ONTARIO: Toronto; QUEBEC: Montreal.

*Trademark of Texas Instruments. †Servicemark of GTE Telenet. Copyright © 1982, Texas Instruments.

291284R1

Managers on the Move

(Continued from Page 20)

man helper. He later served as a junior staff accountant, programmer analyst, senior programmer analyst and systems analyst. Before his recent promotion, he was senior systems analyst.

He earned an associate's degree in accounting at Pueblo Junior College and a B.S. degree in business administration at the University of Denver.

•••

JOEL GADDY has been promoted to data center manager at Gilbert/Commonwealth, an engineering and consulting firm in Reading, Pa. Gaddy has assumed responsibility for the production control, data entry and operations functions in the data processing organization.

Gaddy joined Gilbert/Commonwealth at the company's Jackson, Mich., office as an engineer in the Power Division and later was appointed data processing supervisor in Jackson.

He received a B.S. degree in engineering from Old Dominion University in Norfolk, Va.

•••

WILLIAM T. HOUSTON has joined Colonial Penn Group Data Corp. in Philadelphia as vice-president of the Computer Management Department. Prior to joining Colonial Penn, Houston held several positions with NL Industries, Inc. and most recently was director of management information systems.

He received a BBA degree from St. Johns University and an MBA degree from New York University. He is a member of the Society for Management Information Systems and past president of the Central New Jersey Chapter of the Association of Systems Management.

•••

MIKE MURNANE has been promoted to vice-president and manager of information resource planning for banking systems for Bank of the West in San Francisco. He is responsible for the development of long-range strategies for bank automation.

Murnane joined the bank as assistant vice-president of his department.

He is a member of the Data Processing Management Association.

•••

ROBERT F. MCCAFFERTY was recently elected assistant vice-president of Insurance Data Processing, Inc. in Jenkintown, Pa.

Prior to his position at Insurance Data Processing, McCafferty held the position of service manager with CNA Insurance Co. Prior to that he was manager with Prudential Property & Casualty Insurance Co. and operations manager with MacMillan Publishing Co.

McCafferty received his B.S. degree in industrial management from LaSalle College in Philadelphia.

•••

ED MAZZEO has been appointed director of management information systems for Trico Industries, Inc. in Gardena, Calif. In this new position, he will oversee the company's computer operations and coordinate the development of systems necessary to generate management information.

Prior to joining Trico, Mazzeo worked for City Investing as manager of corporate information systems. He also has several years engineering and marketing systems experience with IBM's Data Processing Division.

He holds a B.S. degree and an MBA from the University of California in Irvine.

•••

JOSEPH A. DEBLASIO has been elected a technical officer in the Operations Division of Manufacturers Hanover in New York.

DeBlasio joined the bank as a senior systems engineer and formerly served as systems programmer for Insurance Services Offices.

He is a graduate of Jersey City State College.

•••

DANIEL J. CERNY has joined Arvey Corp. in Chicago as managing director of management information systems. He will be responsible for the corporate data processing operations.

Prior to this he was managing consultant for Northwest Industries.

He graduated from Illinois Institute of Technology with a B.S. degree in engineering and earned an MBA degree from the University of Chicago.

•••

RICHARD BLOCK has been appointed manager of business systems at Butler International, Inc. in Montvale, N.J. In this capacity, he will be responsible for the design and implementation of data processing systems developed by the Information Systems Department.

Block joined the company as a senior systems analyst. Before that, he was employed as a project leader at American Cyanamid Co.

He is a graduate of Brandeis University.

FROM WALL ST. TO MAIN ST., NEC COMPUTERS MIND YOUR BUSINESS BETTER.

NEC's Astra™—the system built especially for businesses.

Nobody builds computers better than we do. We manufacture the entire system, including all peripherals, so we insure product quality straight down the line. Our state-of-the-art technology combines ease-of-use and renowned product reliability with the high performance you need to keep pace in today's business world. Our user-proven business software solves all your business management problems, from word processing to general accounting. Add to that application packages tailored for a variety of businesses including construction companies, accounting firms, pharmacies, nursing homes and personnel agencies, and you have one of the most versatile and cost-effective systems available.

Our systems range from small, inexpensive desktop units to powerful multistation machines. And they grow with your business. You can easily add capability as your needs change. Because of our communications capability, you can also network your computers across the room or across the country.

Come see for yourself the innovative, reliable business systems that have helped make NEC one of the world's largest computer companies.

Don't delay. See a demo now.

It's the first step in finding a better way to mind your business. Return the coupon to NEC Information Systems, Inc., 5 Militia Drive, Lexington, MA 02173.

Astra is a trademark of Nippon Electric Co., Ltd.

NEC
NEC Information Systems, Inc.

Name
Title Telephone
Company
Address
City State Zip
CW7122

☐ I want to see a demo of the NEC Astra.
☐ I want more information on the NEC Astra.

The Benchmark in World Class Computers

All U.S. Sales/Use Tax Rates on magnetic tape...

SALESTAX

Vertex Systems Inc.
986 Old Eagle School Rd., Wayne, PA 19087
215-687-5000

First in touch

When distributed data processing replaced large CPU configurations, Selecterm emerged with the concept of Data Terminal Management — The Art of Keeping in Touch. Today, Selecterm is First in Touch with: The State of the Art, Individual Systems Needs, Major Manufacturers, Customer Emergencies, Sound Financial Arrangements.

Being First in Touch is important to us . . .
How about you? Call us collect
at (617) 246-1300 today!

SELECTERM
First in touch

Headquarters, 153 Andover Street, Danvers, MA 01923 (617) 246-1300 Boston, Chicago, Los Angeles, New York, San Francisco, Washington, D.C.

County's DP Center Buys Time For Farmers Before Dry Spell Hits

ROSEBURG, Ore. — Farmers in the Cow Creek area of Douglas County with low-ranking water rights used to get a one-day notice before their irrigation water supply was halted. When the summer dry spell hits this year, however, farmers will have two to three weeks in which to plan for the cutoff.

The advanced notice is made possible through a cooperative effort between the state water master and Douglas County's Office of Water Resources. An IBM 4341 Model Group 1 located in the county's data processing center is being programmed with water-flow data about the area. The 4341 was installed in September 1981, according to Kent June of the technical support office in the county's office of data processing. The 4341 is used to support other county programs besides the water program, June said.

Programmers began feeding data into the 4341 last spring, he explained. The data was gathered over a 50-year period of monitoring tributaries, streams and rivers in the Cow Creek area. When data from gauges in the county drainage network is added to current weather and water conditions, county officials will have a better cutoff forecast. The reports produced by the system are part of a water resources management program that county officials hope will solve water problems for the next 40 years.

Access to irrigation water is set according to the date a property owner is granted water rights. A farmer granted water rights in 1970 will be cut off before a farmer granted rights in 1950, June continued.

Douglas County faces the problem of a dwindling water supply, with less than an inch of rain falling in each of the summer months coupled with an increasing demand from irrigation and municipal users.

If farmers have two to three weeks warning before water is cut off, they can plan for the best economic benefit, John Youngquist, deputy director of water resources for the county, said. One of the major crops in the area is pasture for livestock. If farmers know that irrigation water is going to be cut off, cattle can be left to graze on pasture lands that might otherwise be used for growing crops, he explained.

Monthly forecasts of water conditions will be given during the summer, Youngquist said.

County officials will also use data provided by the 4341 to decide on the site for a new dam. The dam would control water flow in wet seasons when flood danger exists, provide a constant water supply to ease summer dry spells and maintain the water quality essential to breeding fish.

Sensors planted in the dam face would monitor the water temperatures at various levels while other monitors would keep track of downstream water temperatures, he said. Water would be released at different levels from the dam when necessary to create the depth and temperature required downstream for fish breeding.

Officials hope to start dam construction in 1983.

Computer Science College To Open in Fall

BOSTON — Northeastern University has established a College of Computer Science, an independent degree-granting academic unit that will enroll its first freshman class this September.

Paul M. Kalaghen, a former director of the Computation Center at the Smithsonian Astrophysical Observatory in Cambridge, Mass., is acting dean of the college. Kalaghen foresees a faculty of 20 members and a student body of 750 within the next three to five years.

The college concept is the result of two years of research and planning by a university computer committee and a consultant group, according to Northeastern.

Zilog's Supermicro

Processor Ends Conversions for Manufacturer

CLEARWATER, Fla. — After going through three conversions in three years, Eva-tone Corp. — a record manufacturing firm here — decided it was time to find a processor that would last.

"We had no time for developing new applications," DP manager Glen F. Mueller said. The firm was using hardware supplied through IBM's then General Systems Division. "If we had stayed with IBM, we'd have needed two System/34 processors." Instead, the firm purchased a Wang Laboratories, Inc. VS 100 processor and reportedly saved $50,000 over the cost of two System/34 processors.

Eva-tone makes thin vinyl recordings, which can be played on an ordinary phonograph. The records are used in magazine advertising campaigns, as well as educational and training applications.

Back in 1973, the company installed a Burroughs Corp. L-5000 processor for accounting. In 1978, the firm made its first major systems upgrade to a disk-oriented IBM System/32 processor. However, Mueller recalled, the company's work load started to accelerate and by the end of 1978, the firm had installed a second System/32 and had a System/34 on order. A year later, it was apparent that another major upgrade was necessary.

Ease Of Conversion

"One of the reasons we decided to go with Wang was the ease of conversion. If we'd gone to the IBM System/38 or 4300 we couldn't convert our programs. We would have had to write programs to first break up all our records and files and then write them all back out on the new equipment.

"Because no one (at that time) had converted from the System/34 to the 4300, that would have been an experiment," Mueller said. "We estimated a conversion time of eight to nine months just for current applications. Going from the System/32 to the 34 had taken us six months, and we had far fewer applications then," he added.

Another reason the firm decided on the Wang processor was that it could support more than one language. Mueller said the System/34 was designed mainly for IBM's RPG programming language, and the firm had a government contract that required Cobol.

"We needed both compilers and sometimes we wanted to mix both. One of the reasons we got the government contract is [that] we said we'd either use their batch system and convert it, or write an on-line entry system for them. We're doing that now," Mueller said.

Eva-tone installed a VS 100 processor with 512K bytes of main memory, an 800M- or 1,600M-byte tape drive, two 288M-byte disk drives, a 600 line/min chain/train printer, a 200 char./sec serial matrix printer, a 600 line/min band printer and eight CRT terminals, Mueller said.

Manufacturing Controls

The firm plans to adapt the VS 100 system to function in its manufacturing operation as well as on the financial side. A manufacturing package that will handle material forecasting and buying, inventory, shop-floor control and other functions will be installed this year.

Another application is in the works to track the availability of raw materials, according to Mueller.

In addition to manufacturing control, Eva-tone has designed an accounting package and is planning a word processing application.

The word processing package, Mueller said, is expected to be able to merge selected paragraphs with a subject'a name, as well as perform on-line inquiry generation of mailing lists.

"As we replace equipment, we'll add CRT terminals instead of typewriters. Eventually all our sales and other WP will be on line. Already we're doing about 20,000 transactions a week, 60% to 75% of our work load, with two big government mailing lists. Eventually we'll have about 80 periodicals on the system. We're also using it for a number of statistical and producer reports," Mueller said.

will free you from mini thinking.

Zilog

System Helps Firm in Battle Against Scoliosis

FREEPORT, Texas — With help from a computerized information management system, Intermedics, Inc. here is working on what may be a medical breakthrough in the treatment of scoliosis.

Scoliosis is a debilitating disease of the spinal column that can lead to severe deformity or even death. It currently affects two million Americans whose only options used to be surgery or a back brace, according to an Intermedics spokesman.

The Scolitron system that was developed to fight the disease resembles a transistor radio, he explained. Two electrodes are placed on lateral muscles to stimulate them while the patient sleeps. The stimulation causes the muscle to contract and pull the spine, thereby straightening it and halting progression of the disease.

"We hope that Scolitron will be commercially available this year," said Steven G. Anderson, vice-president of marketing at Intermedics. The information management provided by Tymshare, Inc. makes that date realistic, he said. "Without it, the data analysis phase of the project — which is required by the [U.S.] Food and Drug Administration — would have been extremely difficult and time-consuming."

Important Goal

One of the most important goals of the intermedics project was to establish a data base on scoliosis.

According to Allen Webb, assistant project manager and designer of the data base, certain features were considered paramount in selecting a computer system. "We wanted a system that was intelligent, flexible, capable of efficiently storing massive amounts of data and easy to use," he said. "Also, we needed reporting and graphics capabilities and the ability to access a comprehensive statistical package. We found that Tymshare's resources best fit our needs."

"Our data base was developed using an information management system from Tymshare," Webb continued. "This system allows us to maintain, access and query our data base; perform analysis; calculate statistics; print reports; and create graphics. However, with Tymshare we can also access other packages such as the Statistical Analysis System, Biomedical Computer Programs and Tell-A-Graf, as they are needed."

Model 430 Installed

In January 1981, a Tymshare Model 430 terminal was installed at Intermedics, along with a Tymshare Model 350 printer. The terminal is connected via telephone lines to the Tymshare computer center in Dallas. According to Webb, the data base was created and the system up and running within two months.

The computer system catalogs the information into four sections. The first consists of personal information such as age, race, symptoms of other diseases, the age when scoliosis was first detected and the family history of the patient.

The second section consists of the physical characteristics of each patient — height standing and sitting, trunk alignment, any discrepancy in leg length (in scoliosis patients, one leg is sometimes shorter) and the location of any rib hump.

X-ray data makes up the third. The patient is x-rayed from standing, prone and lateral positions. The size, length, location, flexibility and rotation of the curvature is recorded. Also, the degree of hunchback or swayback associated with the scoliosis is revealed.

The fourth section tracks stimulator information. Data entries in this category include the model number, serial number, pulse width, pulse current, placement of the electrodes and other such pertinent data, according to Webb.

"Because we have updates on each patient every three months but must still retain all past history on the patient, our data base grows very quickly," Webb said. "We currently store information on more than 500 scoliosis patients, and the file on each is extensive."

COMPUTERWORLD

. . . the one weekly newspaper that's designed to fulfill your unique "need to know" . . . the one newspaper that can give you all the current information you need to benefit you, your organization and your career progress . . . 52 weeks of incisive news, commentary and special reports . . . subscribe today, use the attached postage paid order form.

☐ Please enter my subscription
(details on back)

☐ I'm already a subscriber, but I'd like you to change my:
- ☐ address
- ☐ title
- ☐ industry
- ☐ other

My current mailing label is attached and I've filled in new information on the other side

Put old label or label information here

Please send me COMPUTERWORLD for one year **RATES: United States $44; Canada, Central & South America $110; Europe $165; All Other Countries $245 (Airmail Service)**

☐ Check Enclosed
☐ Am Ex ☐ BA/Visa ☐ MC

(MC Only - List four digits above your name)

If charge we must have cardholder's signature: _____ Expiration Date _____

First Initial	Middle Initial	Surname
Your Title		
Company Name		
Address		
City	State	Zip Code

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*.

☐ Check here if you're interested in receiving information on *Computerworld's* Index

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY

10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other _____

TITLE/OCCUPATION/FUNCTION

11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/Administrative Service
22 Director/Manager/Supervisor OP/MIS Srvs
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mtg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other _____

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Box 897, Framingham, MA 01701-9985

Detach here, fold, and place in post-paid envelope attached through binding.

Keeps Tabs on Expense, Cost Figures

Film Studio Reviews Profitability With DBMS

LOS ANGELES — Twentieth Century-Fox Film Corp. is giving rave reviews to a data base management system (DBMS) that has expedited and enhanced its monthly financial statements and analyses.

Such Fox hits as *Star Wars, The Empire Strikes Back, 9 to 5* and about 75 others have all had their profitability tracked with the Nomad DBMS from National CSS, Inc., a Fox spokesman said.

Martin Shindler, director of financial reporting at Fox, oversees the preparation of financial statements for each film made by the studio. He and his staff have been using the DBMS since late 1978. Their application started with some simple amortization calculations producing simple reports, but all financial reporting for the film division is now being handled by the DBMS.

"Our only alternative at the time was to do the reports manually, barely meeting our deadlines for getting the reports produced. Now, we not only get the reports produced by the deadline, we also have time to analyze the results and ask questions about the numbers," Shindler said.

Noting that over 75% of the films made in the industry today never turn a profit, Shindler said it is crucial to watch the profitability of each film closely. The studio's system tracks each film produced by Fox's Feature Film Division. Over 400 items exist in the data base to keep tabs on cost and expense figures for each individual picture. Financial statements are prepared from this data for the entire division, he said.

Shindler came to Fox as a financial analyst in June 1979, when use of Nomad at Fox was just beginning. He was promoted to senior financial analyst in February 1980, manager of financial reporting in October 1980 and director of financial reporting in April 1981.

Tracking Profitability

How does Nomad help Fox track its picture profitability? According to Shindler, "it incredibly speeds up and enhances the monthly financial statements and analysis. A data base management system is a must for our operations now." He added, "It used to be all we could do was get the statements together. There was no time to analyze ... to ask why a number was this high or this low. Now, with Nomad, we can analyze and get the information we need. It is one of our primary tools [with which] to do our work."

The DBMS' flexibility has come into play on numerous occasions when the applications requirements have changed. Just recently, Fox added several different data items to a schema that already totals more than 400 items. Nomad's schema REORG simplified this task, he said. Another type of application change that was needed once for their most popular film of all time — *Star Wars*.

The item designated to track film rentals was given a maximum size of $99 million, he recalled. One day, one of the reports showing film rentals reported "*****" for the film rentals for *Star Wars* — which had exceeded the $100 million mark for rentals, something the original designers of the data base had never anticipated. A quick REORG of the schema to expand the item's size was performed and everything was in order.

Now you can provide faster, better service to business professionals. Let them meet many of their DP needs themselves—with a little help from your professional staff.

Set up an Information Center. There, end users learn to work at conveniently located terminals, supported by easy-to-use software: query languages, analysis tools (such as financial planning and business graphics) and report writers.

A small staff from your department determines user requirements, provides education and assures easy access to data.

Quickest Results

With an Information Center, business professionals can get results sooner. They can handle their own small projects, freeing DP people to concentrate on the larger, more complex applications, and on maintenance.

At Rustoleum Corporation, Vernon Hills, Illinois, MIS director [illegible] says: "Our Information Center has let us cut [illegible] by more [illegible] problem-solving and report generation."

At the Buick Motor Division, Flint, Mich., James N. Brownlie is Director of Information Systems. "Buick's objective is to make effective use of new technology," he says. "Bringing this latest programs/systems development technology to our end users has resulted in substantial productivity gains."

By providing expert guidance, proper hardware resources and the best possible software, you can help make sure that every user's project is successful.

Business professionals can share terminals or personal computers in a Center, or you can install this equipment in their offices.

A Proven Success

The Information Center is a proven success with many IBM customers. Learn what this innovation can do for you. Call your local IBM representative today or send us the coupon.

elp themselves.

IBM

Mr. W.E. White CW-7-12
Information Center
1133 Westchester Ave.
White Plains, N.Y. 10604

Please send me more information on implementing an Information Center.

Name
Title
Company
Address
City State Zip
Phone

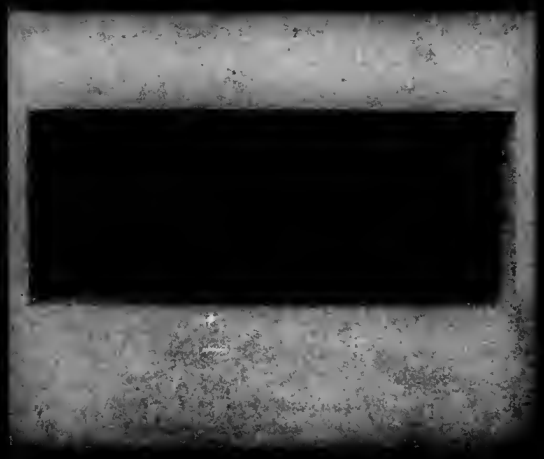
MAGNETIC TAPE SYSTEM FOR IBM SYSTEM/34

Connect communications adapter to rear of Tape System, load S/34 Utility Program, and begin processing.

Transmit and receive data from any IBM bisynchronous device

$16,500

GENERAL SYSTEMS CENTER, INC.
(516) 754-8140



Some day, everyone else will deliver DDP in one system. Just like ours.

Right now, you can get flexible distributed data processing in a single system from Honeywell. And it's ideal for almost any environment and application.

With the proven, multifunctional GCOS 6 MOD 400 Executive, there is no limit to the number and mix of programs that your system can handle. And they're all supported by SNA RJE 3777-3, SNA Interactive (3274-1C Controller), 2780/3780 RJE, HASP, Programmable Facility 3271 and standard Honeywell protocols.

And our DPS 6 single system solution allows you to choose from 12 models with four processor levels in the industry's only field-expandable family of mini and super mini computers.

So if you want a growth path from BSC to SNA, you have it with Honeywell.

Office Automation options.

Honeywell offers a powerful office automation facility which can integrate data from satellite or host systems with text processing.

Electronic mail helps speed the transmission of information. And you can add smaller administrative and standalone systems when you need them.

Source or centralized data entry in one package.

Data Entry Facility II (DEF II) is a forms-mode facility with powerful editing and validation features. Its comprehensive job and batch controls make it practical for any operations environment.

It even has report programs so you can track the operator's productivity.

High performance transaction processing.

Transaction Processing System 6 (TPS 6) is ideal for multiprogramming. It offers real-time interactive or batch transaction processing with powerful data base management services.

Also, to help preserve programmer resources, Honeywell's TPS 6 incorporates SCREENWRITE, an easy-to-use language that simplifies program writing.

And for ANSI 74 COBOL programs, TPS 6 has a wide range of sophisticated development tools.

Query and report writing for everyone.

To speed the delivery of information, Honeywell offers INFO 6 – an efficient conversational query, report writing inquiry and update system. Even non-EDP people will find it easy to use.

Efficient application development.

GCOS 6 offers a comprehensive set of program development components, utilities, and debugging aids. All ideal for applications written in RPG and ANSI standard FORTRAN, BASIC and COBOL.

One DDP system – one Toll Free call.

Find out how you can have total DDP functionality in one DPS 6 system. How you can save on the expense of developing and maintaining extra interface software. And how you can avoid the frustration of managing split programmer resources.

For more information call **800-343-6294** (within the 617 area, call 552-2264) or write to the Honeywell Inquiry Center, 200 Smith Street (MS 487), Waltham, Massachusetts 02154.

Honeywell

You should see what we do with computers.

Call for Papers

OFFICE SYSTEMS RESEARCH ASSOCIATION (OSRA) '83, Philadelphia, Feb. 19-20.

Osra is accepting papers for presentation at its second annual conference. A broad range of office automation research topics will be considered including case studies, overviews, behavioral and psychological implications, environmental factors, career opportunities, white-collar productivity, implementation strategies and collegiate education for the automated office.

Papers and proposals should be submitted by August 31 to Joel D. Levy, Osra Conference Chairman, c/o Bausch & Lomb, 1400 N. Goodman St., Rochester, N.Y. 14692.

INTERFACE '83, Miami Beach, March 21-24.

Interface is seeking papers eligible for presentation that relate to an aspect of data communications and/or information processing, technology, management, policy or strategy. The author of the best paper will receive the Harry R. Karp Award and $3,000.

Abstracts should be no more than 100 words and are due Sept. 1. Abstracts should be submitted to the Program Department, Interface, P.O. Box 927, 160 Speen St., Framingham, Mass. 01701.

THE FIFTH ANNUAL INTERNATIONAL CONFERENCE ON COMPUTER CAPACITY MANAGEMENT, New Orleans, April 18-21.

The conference is inviting papers, case studies, tutorials or experimental results directed toward what a company requires from DP and how DP can meet these requirements. The theme of the conference is "Effective MIS Management." Papers may be technically or management-oriented and should be limited to a presentation time of 30 minutes. Suggested topics include effective data base design, business plans integrated into DP plans, financial management aspects, service-level management and reporting, workload characteristics and forecasting, equipment inventory management, costing and income management, budget and project management, efficiency of high-level languages, data reduction techniques, modeling, performance reporting, capacity usage reporting, improving programmer productivity, user management views of DP, instrumentation for capacity management, configuration design, performance of user utilities and designing on-line applications for performance.

Abstracts are due Sept. 1 and should be sent to the Institute for Software Engineering, 410 Oakmead Pkwy., Sunnyvale, Calif. 94086.

NATIONAL MICROGRAPHICS ASSOCIATION CONFERENCE AND EXPOSITION, (NMA) '83, Philadelphia, April 11-14.

NMA is inviting papers for presentation concerning information processing technologies for the technical specialist and the nontechnical or managerial information generalist. Areas of interest include computer-assisted design, office automation, computer graphics, electronic mail, fiber optics, human factors in the office, intelligent copiers, laser technologies, networking, satellite transmission, teleconferencing and strategic planning for office automation.

Abstracts and outlines (250 words minimum) are due by Sept. 3 and should be addressed to Gary W. Pack, Program Review Committee, NMA, 8719 Colesville Road, Silver Spring, Md. 20910.

CONFERENCE ON APPLIED NATURAL LANGUAGE PROCESSING, Santa Monica, Calif., Feb 1-3.

The Association for Computational Linguistics and the Naval Research Laboratory are inviting papers on the use of computational linguistic techniques. Areas of interest include data, information and knowledge management, training and education, language translation technology and speech recognition and synthesis. Papers should discuss applications, evaluations, limitations and general tools and techniques. Papers describing end-users' experiences with these technologies are especially welcome.

Six copies of an extended summary (5-8 pages) should be sent by Aug. 15 to Beatrice Oshika, System Development Corp., 2500 Colorado Ave., Santa Monica, Calif. 90406.

OPTICAL FIBER COMMUNICATION (OFC) '83, New Orleans, Feb. 28-March 2.

OFC is seeking papers on optical fiber communications and related topics ranging from basic research to hardware manufacture and systems development and applications. The conference will be divided into three principal areas: fibers and cables; active and passive components; and systems, subsystems and new applications.

Both the abstract (35 words) and summary (200-500 words) with a set of figures suitable for digest publication (glossy photographs or original line drawings) are due Sept. 24. All submissions should be forwarded to OFC '83, c/o Optical Society of America, 1816 Jefferson Place N.W., Washington, D.C. 20036.

IEEE COMPUTER AND COMMUNICATIONS SOCIETIES' IEEE INFOCOM '83, San Diego, April 18-21.

The IEEE Computer and Communications Societies are seeking papers for their second annual joint conference titled "Computers and Communications Integration: Reality and Illusion." Areas of interest include, but are not limited to: computer network architectures, digital private branch exchanges, multiaccess communication local networks, bus architectures, communication protocols, software design, distributed processing, communication media, office automation, distributed data base systems, user experiences, computer communications standards, privacy and security, social impact and integrated services digital networks.

Completed papers (four copies) are due Aug. 15 and should be submitted to Dr. John Spragins, Program Chairman, IEEE Inforcom 83, P.O. Box 639, Silver Spring, Md. 20901.

INTERNATIONAL SYMPOSIUM ON COMPUTER ARCHITECTURE '83, Stockholm, Sweden, June 13-16.

The Institute of Electronics and Electrical Engineers, the Association for Computing Machinery, Euromicro and the National Swedish Board for Technical Development are soliciting papers on aspects of computer architecture.

Topic areas include architectural aspects of numeric and symbolic computation, architectures for knowledge-based systems, data and demand-driven architectures, educational and descriptive aspects of computer architecture, impact of advances in microelectronics and optics, object-oriented architectures, principles of interconnection, tools and methods for architecture description and synthesis, vertical function distribution and distributed and parallel architectures.

Submitted papers will be accepted for evaluation until Oct. 15. Five copies of the manuscript should be sent to Prof. Jean Loup Baer, University of Washington/Computer Science Group, Seattle, Wash. 98105.

LEARN CICS THIS SUMMER

COURSE	JULY	AUGUST	SEPT
APPLICATION DESIGN	—	—	NYC 9/7-10
COMMAND LEVEL PROGRAMMING	NYC 7/12-16 CHI 7/19-23	NYC 8/9-13	NYC 9/13-17 CHI 9/20-24
COMMAND LEVEL INTENSIVE (2 wknds)	CHI 7/17-18 & 24-25	NYC 8/7-8 & 14-15	CHI 8/18-18 & 25-26
MACRO LEVEL PROGRAMMING	—	—	NYC 9/27-10/1
INTERNAL ARCHITECTURE	NYC 7/26-30	—	NYC 8/20-24

Not all CICS courses are alike. Only SysEd prepares reference manuals full of real life sample programs and case studies—the kind you'll need and use long after you've taken the course. Only SysEd has fully-equipped Computer Labs where you'll spend hours in workshop sessions actually programming CICS on our 4341 computer using 3270's dedicated to the class. Classes are held in New York City and Chicago. So get smart this summer, call David Shapiro (212) 889-3386.

SYS-ED

ONE PARK AVENUE, NEW YORK, NY 10016 • (212) 889-3386

ATTENTION USERS OF

IBM 8100

UPDATE/PX is a monthly newsletter with the very latest information on IBM products and strategy, third party hardware and software, experiences of other users, etc. Find out why over 400 8100 users subscribe to UPDATE/PX.

FOR A FREE COPY

Call or write today

DPX, Inc. Dept. CW/2 10902 Northfield Sq. Cupertino, CA 95014 (408) 253-6691

VAX SOFTWARE!

PACS with EZLOG is today's standard in:

Resource Accounting
Performance Monitoring
Internal/External Billing
Project-Based Accounting

PACS with EZLOG can be yours with a telephone call. Get details now.

STi Signal Technology, Inc.

5951 Encina Rd., Goleta California 93117 (805) 683-3771
Outside California Call Toll Free (800) 235-5787

VAX is a registered trademark of Digital Equipment Corporation

TERMINALS FROM TRANSNET

[illegible]

	Purchase	12 mo.	24 mo.	36 mo.
DEC				
LA34 DECwriter IV Forms Ctrl.	$1,[illegible]	$100	$[illegible]	$40
LA100 Letter Printer RO	1,[illegible]	[illegible]	[illegible]	77
LA120 DECwriter III KSR	2,[illegible]	[illegible]	122	[illegible]
LA180 DECwriter III RO	2,[illegible]	[illegible]	[illegible]	[illegible]
LA12A Portable DECwriter	[illegible]	[illegible]	[illegible]	[illegible]
VT100 CRT DECscope	1,[illegible]	[illegible]	[illegible]	[illegible]
VT101 CRT DECscope	1,[illegible]	[illegible]	[illegible]	[illegible]
VT125 CRT Graphics	2,[illegible]	[illegible]	[illegible]	[illegible]
VT131 CRT DECscope	1,[illegible]	[illegible]	[illegible]	[illegible]
VT132 CRT DECscope	1,[illegible]	[illegible]	[illegible]	[illegible]
VT18XAC Personal Computer Option	2,[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				
T745 Portable Terminal	1,[illegible]	[illegible]	[illegible]	[illegible]
T765 [illegible] Terminal	2,[illegible]	[illegible]	[illegible]	[illegible]
T940 CRT	1,[illegible]	173	[illegible]	[illegible]
T785 Portable KSR, 120 CPS	2,[illegible]	[illegible]	[illegible]	[illegible]
T787 Portable KSR, 120 CPS	2,[illegible]	273	[illegible]	[illegible]
T810 RO Printer	1,[illegible]	[illegible]	[illegible]	[illegible]
T820 KSR Printer	2,[illegible]	211	117	[illegible]
[illegible]				
ADM3A CRT Terminal	[illegible]	[illegible]	[illegible]	[illegible]
ADM5 CRT Terminal	[illegible]	[illegible]	[illegible]	[illegible]
ADM42 CRT Terminal	1,[illegible]	[illegible]	[illegible]	[illegible]
DATAMEDIA				
EXCEL 12 CRT Terminal	1,[illegible]	[illegible]	[illegible]	[illegible]
EXCEL 42 Smart Buffered CRT	[illegible]	[illegible]	[illegible]	[illegible]
COLORSCAN 80 Color CRT	3,[illegible]	[illegible]	171	110
[illegible]				
910 CRT Terminal	[illegible]	[illegible]	[illegible]	24
920 CRT Terminal	[illegible]	[illegible]	[illegible]	[illegible]
950 CRT Terminal	1,[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				
Letter Quality, 7710 RO	2,[illegible]	[illegible]	[illegible]	[illegible]
Letter Quality, 7720 KSR	2,[illegible]	[illegible]	[illegible]	119
GENERAL ELECTRIC				
2030 KSR Printer 60 CPS	1,[illegible]	[illegible]	[illegible]	[illegible]
2120 KSR Printer 120 CPS	2,[illegible]	211	117	[illegible]
EPSON				
MX-80 F/T Printer	[illegible]	71	[illegible]	[illegible]
MX-100 Printer	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				
[illegible] 4 Channel Stat Mux	1,[illegible]	147	[illegible]	[illegible]
[illegible] 8 Channel Stat Mux	2,[illegible]	[illegible]	[illegible]	74

[illegible]

ACCESSORIES AND PERIPHERAL EQUIPMENT

[illegible]

Calendar

Aug. 2-4, Atlanta — **Introduction to Word Processing: Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-4, Boston — **Advanced DP Management: Methods and Techniques in the '80s.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-4, Dallas — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 2-6, Cambridge, Mass. — **Operating Systems.** Contact: The Office of the Summer Session, Room E19-356, MIT, Cambridge, Mass. 02139.

Aug. 2-6, New York — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umlor, DP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Aug. 3, Boston — **Dealing With Vendors & Suppliers.** Contact: Performance Seminar Group, 1 Commerce St., Norwalk, Conn. 06850.

Aug. 3-5, New York — **SAS Computer Performance Evaluation Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Aug. 4-5, Atlanta — **Advanced Application and Techniques in Sales Forecasting.** Contact: American Software, 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

Aug. 4-5, Cary, N.C. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Aug. 4-6, New York — **SAS Exploratory Multivariate Data Analysis Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Aug. 4-6, Washington, D.C. — **Structured Systems: Analysis, Design and Programming.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 4-6, Washington, D.C. — **Data Security: Implementation and Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 5-6, Boston — **Software Life Cycle Documentation.** Contact: Education Foundation of the Data Processing Management Association Seminar, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Aug. 5-6, Saddlebrook, N.J. — **Understanding New Telecommunication Technologies for Nonengineers.** Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

Aug. 5-6, Saddlebrook, N.J. — **Telecommunications Technologies and Strategic Planning.** Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

Aug. 5-6, Summit, N.J. — **IMS Data Communications.** Contact: Chubb Institute Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Aug. 5-6, San Jose, Calif. — **Structured Methodology.** Contact: Education Foundation of the Data Processing Management Association, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Aug. 5-6, Houston — **How to Develop and Use a Computer-Based Marketing Information System.** Contact: University Seminars, Suite 2846, 420 Lexington Ave., New York, N.Y. 10017.

Aug. 8-12, Karlsruhe, West Germany — **International Joint Conference on Artificial Intelligence.** Contact: Alan Bundy, Department of Artificial Intelligence, University of Edinburgh, Hope Park Sq., Meadow Lane, Edinburgh, EH8 9NW, Scotland.

Aug. 9-10, Cleveland — **Data Communications: Advanced Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 9-10, Chicago — **Using CAD/CAM Systems: Planning, Equipment Selection and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 9-11, Washington, D.C. — **Information Systems Planning: A Structured Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 9-11, Los Angeles — **Data Communications: Effective Network Design.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Aug. 9-11, Los Angeles — **Data Processing: Fundamental Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

'PharmaSources' 1982 Edition Out

PRAIRIE VIEW, Ill. — The 1982 edition of *PharmaSources* was released here by Flexible Software, Inc.

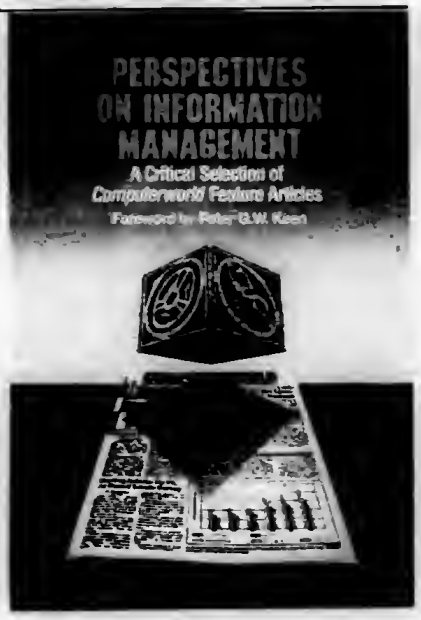
The 170-page directory contains pharmaceutical, biological and medical software and data base services fom all over the world, according to the publisher. It also includes statistics, graphics and chemistry software.

PharmaSources-82 costs $85 from Flexible Software at P.O. Box 47, Prairie View, Ill. 60069.

"This book is a pleasure...

"It is remarkable in its breadth, which has not been obtained at the cost of depth. It is unusually interesting and lively and one of the few books in this field you can actually enjoy reading for its own sake as opposed to duty and moral edification. It should be especially valuable in helping DP practitioners expand their focus."

—**Peter G. W. Keen**
Sloan School of Management, MIT
(in the Foreword)



PERSPECTIVES ON INFORMATION MANAGEMENT

A Critical Selection of *Computerworld* Feature Articles

Foreword by Peter G.W. Keen

In 1979, COMPUTERWORLD, the world's largest publication for the computer and data processing industry, began a new feature section called "In Depth." The articles that appeared were just that—*in-depth* writing that went beyond the news reporting level, and offered deeper insights and more practical information. To be "In Depth," each article had to be written by a practicing professional who knew his or her field inside out.

"In Depth" met with such success that COMPUTERWORLD launched COMPUTERWORLD EXTRA!, a thrice-yearly magazine of original articles. Today, thousands of computer and DP people rely on COMPUTERWORLD "In Depth" and EXTRA! features to keep up-to-the-minute on new developments, and get practical insights on how to be more effective in their work.

This book collects the best articles from "In Depth" and EXTRA!...articles that have had a major impact on the field of information management. Organized by topic for quick reference, *Perspectives on Information Management* gives you ready access to the best new ideas, techniques, and strategies in systems design, hardware, software, data communications, law, data base management, distributed processing—in short, every important and emerging area of information management.

Use this coupon to order your copy today, or order through your local bookstore.

Mail to: **WILEY-INTERSCIENCE**, a division of John Wiley & Sons, Inc.
605 Third Avenue, New York, N.Y. 10158 Attn: Maribeth Payne

Please send_____copy(s) of **PERSPECTIVES ON INFORMATION MANAGEMENT: A Critical Selection of Computerworld Feature Articles**
(ISBN 0 471 86924-4) at the price of $19.95 per copy.
(Orders accompanied by payment will be sent postpaid.)
( ) Payment enclosed plus sales tax.
( ) Bill me. ( ) Send for 15 days examination.

Name_____ Affiliation_____

Address_____

City/State/Zip_____

0923-4071

Price subject to change without notice.

EDITORIAL

Probing Problem Drivers

Congress is about to approve a multimillion dollar program to build a nationwide, on-line DP/telecommunications system that will provide state driver licensing authorities with information on problem drivers [CW, July 5]. The National Driver Register (NDR) would be run by the Department of Transportation, which only a year ago said the system should not be built.

At that time the Department of Transportation, having made an extensive study of the NDR proposal, said the system would not be effective because at least some states would balk at participating. The reasons were cost, privacy and constitutional rights considerations, as well as a reluctance to allow the federal government to interfere in the authority of the states to license drivers.

The Reagan administration has now been persuaded to back the NDR proposal by groups seeking stricter laws against drunk driving. Unfortunately, it is a cruel hoax on these worthy organizations to suggest the NDR will stop the senseless death and destruction caused by drunk drivers.

These organizations hope to stop drivers who have lost their licenses for drunk driving from getting permits in other jurisdictions. But unless almost all states are willing to participate, willing to change their privacy laws to do so — including instituting use of Social Security numbers as universal identifiers — and willing to put up millions of dollars to keep the NDR running, the system has no realistic hope of success.

Even if the states cooperate, the system will do nothing to keep suspended drivers from driving without permits or driving while intoxicated, which is the real problem in the first place. In the end, the likely result of the NDR proposal will be a hundred million dollar boondoggle that is an invasion of privacy, may be illegal and unconstitutional for the federal goverment to run, will have a large problem with data error and probably won't work anyway.

Most *Computerworld* readers do not have to be reminded that even the most sophisticated computers can only do so much. Automating an ineffective or bad system does not necessarily make it a good system. But sometimes makers of public policy and national laws can be carried away with false expectations that if enough money is spent on enough computers, just about any problem can be solved.

The NDR is a perfect example of the limits of technology.

DATA PAST

Five Years Ago
July 11, 1977

WASHINGTON, D.C. — The President's Reorganization Project in the Office of Management and Budget began a comprehensive examination of all federal DP procurement and management, according to then-project associate director Wayne G. Granquist.

— — —

WASHINGTON, D.C. — The Justice Department formally revoked a memorandum authorizing the Federal Bureau of Investigation to develop a computerized message-switching system.

The system, which could have monitored the communications functions of state and local law enforcement agencies, was turned down by the Ford administration but resurfaced.

Ten Years Ago
July 12, 1972

WASHINGTON, D.C. — The Supreme Court "unwisely and wrongly" ignored the danger of computer-based data banks when it rejected an attempt to outlaw such dossiers in the *Tatum vs. Laird* case, then-Sen. Sam J. Ervin charged.

Ervin introduced legislation in the Senate to ban the Army or any military service from conducting data bank operations on civilians.

— — —

DAYTON, Ohio — Codasyl's Programming Language Committee considered a proposal to delete the Report Writer facility from the Cobol standard.

The Air Force proposal called for the dropping of the RPG-like function.

LETTERS

More Information

I was very pleased to read about my presentation at the National Computer Conference ["Medical DSS Development Seen Difficult, Inefficient Process," CW, June 14].

Unfortunately, the article quotes me as saying thet "the system is not being made available commercially."

This is incorrect and not what I stated at the conference. I said that while the Knowledge Management System is not itself available, an augmented commercial version has been implemented.

Information on the commercial system may be obtained from Knowledge Engineering, Inc., Suite 1220, 1401 Wilson Blvd., Arlington, Va. 22209.

James A. Reggia
Department of Neurology
University of Maryland Hospital
Baltimore, Md.

Some Notes on DES

Michael Schwartz's In-Depth article, "DES: Putting It to Work" [CW, June 21], was a good introductory presentation of a complex subject. However, he made a couple of serious mistakes that need to be corrected.

If, as noted on Page ID/7, the DES is used as a pseudo-random number generator (and this observation is correct), then contrary to Page ID/10, it is not possible to use frequency analysis to recover the data.

Elsewhere the author indicates that errors are helpful to data communications.

This is definitely not the case. The receiver has no way to know that the data is wrong, using the DES, as on the receiving end all data must be considered as what was intended to be sent.

Using the usual techniques for cyclic redundancy check (cyclic check character), any errors in data communicationa will be detected independently of the DES or having any knowledge of whet data was a priori correct.

Even decrypting erroneously received data would not tell the receiver thet the data was wrong.

Whether the DES was used or not, the only way to detect errors requires additional information (such as the cyclic redundancy check) to be sent as an adjunct to the real data. The data itself cannot carry the information of its correctness. The usual data communications techniques are quite adequate to ensure reliable data transfer without the DES, which cannot assist the communications process.

I also noted some minor errors that were of no consequence to the understanding of the principles involved.

For historical accuracy it should be noted thet the Vernam technique is quite different from the One-Time Pad. The Vernam technique XORs the data with a random bit pattern that repeats at regular intervals, although usually large intervals are used.

Schwartz made a very good point abut key control, but his statements about waking up major companies to the (alleged) need of the DES detract from his article.

William B. Adams
Adams & Associates
Springfield, Va.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

READER COMMENTARY / Robert Davis

Data Relational Analysis: A Rational Approach

If a programmer makes a mistake while coding a program, it normally will cost the project no more than a couple of days to find and fix the error.

If, on the other hand, a system designer makes a mistake and it is not discovered until after the programming has been done, this mistake could very well cost the project a week or more.

But the most disastrous errors of all are those made by systems analysts. Their mistakes can cause whole portions of a system to be scrapped and redone, causing weeks or even months of delay.

What is needed, if we are to avoid these costly mistakes, is a more rational, disciplined approach — an approach with a proven conceptual base that is effective in the business world. Data relational analysis is such an approach.

To understand the conceptual foundation of data relational analysis, we must start defining what a system is.

A system is just a collection of objects that are related to one another. If the job of the systems analyst is to define a system, and if a system is just a collection of objects and relationships, then the job of the systems analyst must be to identify for the system in question particular objects and relationships.

Business information systems are intended to take data that, from the user's point of view, is not in a particularly useful arrangement and rearrange the data in such a way that it becomes useful.

The two key components of such a system are its data and the processes or functions that perform the desired transformations. Of these two components — data and function — data is the more direct determinant of a system's objects and its relationships. That is because data is really just the representation of particular occurrences of a system's objects.

For example, a particular employee's name, address and telephone number is just one unique occurrence of a system object called "employee." If that same data also included a list of job function codes, then it would represent an occurrence of two objects, "employee" and "job function."

It would also indicate that a relationship exists between these objects, perhaps called "performs" (such as employees perform job functions). The data comprises the system's objects.

Responsive to User

It is generally agreed that for a business information system to be effective it must be responsive to the needs of its users. The information needs of users are the products of business information systems. They are the system's outputs. And outputs, no matter what their presentation media, are just data arranged in some particular manner. This is exactly what we're looking for — data and its structure.

Consider, for example, a training operations system that produces as one of its outputs a class schedule. This class schedule includes data such as course name, starting date, ending date and classroom, arranged so as to be most usable by potential students.

By defining the data content and structure of each information requirement of each system user, we will have identified all the data the system requires and all the ways it must be structured.

By normalizing this data we are able to derive the system's objects. Normalization is a method for finding the least common denominator. It is a way of ensuring that if we are dealing with apples and oranges we call them both fruit.

The relationships between a system's objects are a reflection of the objects and relationships users perceive to exist in the real world. They are not imposed by the systems analyst.

But how does the system analyst know who the users of a particular system are and which of their information needs the system must satisfy? The system analyst must first determine two things: What is the purpose of the system in question and what is its scope?

A system's purpose is defined by its sponsors — the people who pay the bill for its development and operation. These are the people who must decide why the system is being built.

The system analyst's job is to assist the system's sponsors in clearly stating the system's purpose. But knowing the system's purpose is not enough. The systems analyst must also know what the boundaries are.

A system's boundaries are identified by defining its goals and objectives. Goals are statements of what a system must achieve in order to be considered a success. Objectives identify how that success is to be measured.

Consider the previously mentioned training operations system. Its purpose might be to facilitate the operation and administration of the company's training organization.

This explains why the system is being built. One goal of this system might be to inform potential students of all formal training opportunities with sufficient lead time to take full advantage of these opportunities.

This objective defines how the system will be judged at achieving the above stated goal. It defines what must be produced, for whom, by when and with what accuracy. From this objective, the systems analyst can easily determine that employees are users of the system and that a class schedule is one of their information requirements.

Knowing this, the systems analyst can meet with representative employees to identify more precisely what is needed.

In summary, the key concepts of data relational analysis are:

- A system is a set of objects and their relationships.
- These objects and their relationships can be derived from its data and that data's organization.
- A system's data and its organization is best identified by those user information needs that it must satisfy to be a success.
- The user's information needs that a system must satisfy are those identified by the system's purpose, goals and objectives.

These four concepts are the essence of data relational analysis.

Davis is a principal at Data Kinetics, a data processing consulting firm located in Princeton, N.J.

HUMAN CONNECTION / Jack Stone

Staff Morale Takes Cue From Management

This is Part 11 of a continuing series on how to succeed as a data center manager.

Believe it or not, it is possible to build and maintain the morale of data processing professionals, but not without a substantial application of time, effort and now, more than ever, creative thinking on the part of data center management.

Stephen Roberts, who was responsible for administrative systems at Catholic University of America, was quite aware of staff morale problems as he implemented a string of new operational policies that were intended to convert the systems activities into something resembling a conventional business operation and bring the staff into the office during normal work hours.

Many long months passed for him until the DPers finally — and grudgingly — accepted the policies. Unfortunately, they were unhappy about it and continued to find excuses for not showing up from nine to five.

Personnel Battle

So Roberts jumped into the personnel battle with both feet. Fortunately, he had the wisdom of Karl Thomas, the center's director, for support. One of many useful guidelines that Thomas suggested to Roberts was this: "Follow-through in personnel actions is as important as the action itself. Don't give an order or set up a new procedure or announce a policy change unless you know it will succeed and you will pursue it vigorously."

Roberts addressed the morale issue in a variety of ways. He organized a weekly staff meeting to ensure a regular, formal means of communication which, to this day, is held religiously each Friday afternoon. New tasks are announced, progress on old tasks are reported on and personnel assignments are distributed there.

The meeting also provides a forum for airing problems and receiving staff opinions on possible policy changes.

But Roberts was quick to note that "I give the staff the opportunity to comment on pending policies in advance, but there is a limit on their share of 'participative management.' Policies that govern the operations of my systems staff are not derived by committee action but are mine alone."

Roberts initiated centerwide, center-sponsored social lunches. He started them as "going-away parties" to celebrate the departure of a staff member, but soon changed the theme to "survivor's parties" given for the remaining staff the day *after* a DPer left.

He established a program of recognition for well-deserving members of his staff. He made it a point to say "well done" or suggest a letter of commendation from Thomas or the university when appropriate. He even encouraged users to toss a bash for his staff when major systems came on-line.

Roberts adjusted the task assignments as necessary to give the staff variety in both type of system and intensity of work. He frequently rotated staff, at all levels, among the various systems, which also provided the major benefit of cross-training. He varied the pace of tasks to relieve work pressures and keep the staff from "burning out."

Physical layout was not a serious problem since nearly all the staff had individual offices and their own terminals. But sprucing up the public areas and new paint for the offices were necessities, and these projects were completed.

But it was the matter of personal leadership that did the most for morale. Roberts expressed it this way: "It took me a while to appreciate it, but staff morale derives in no small way from my own [morale] in the role as their manager.

"Let's take documentation, for example. As an analyst I hated to document systems, a viewpoint that carried over when I first became a manager. So I allocated these tasks to the staff with an apology and some words like 'somebody's got to do the dirty work.'

"I figured out later that I was discouraging the staff from taking a positive view toward documentation, so I changed my approach in a hurry."

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

IMS Users Get Transaction, Monitor Tool

CARMEL, Ind. — A real-time monitor and transaction accounting package for users of IBM mainframes and plug-compatibles has been announced here by Omnimon.

The IMS Ata Glance (IAG) package has four 3270 screen formats using high and normal intensities or color to display information, according to the vendor. The accounting component produces a record for each transaction, including user identification, transaction name, CPU time, elapsed time and data base calls/user. A batch program produces a graph summary report for the entire monitor period, a report of all exceptions, an accounting report of each transaction and an accounting data set containing a 60-byte record of each transaction, the vendor said.

IAG reportedly requires no modification and can be installed on systems running IBM's IMS that are operating in an MVS or VS1 environment. The purchase price of $4,850 includes a 30-day trial period and one year of maintenance.

Omnimon can be contacted at Box 745, Carmel, Ind. 46032.

APL*Plus With Nested Arrays Said Time-Saver in Development Project

By Lois Paul
CW Staff

BELLEVUE, Wash. — A prototype of a software development project that probably would have taken five weeks if written immediately in the prescribed assembler language was prepared in four days using STSC, Inc.'s APL*Plus with its recently announced nested arrays extension.

The project involved a proposed enhancement to a utility included with VM Software, Inc.'s VMbackup for users of IBM VM/370 or VM/SP systems.

A working document of the proposed enhancement was developed by Ron Kral, director of development for VM Software. "We supply with the package the VM directory, which extracts the mini disk records and builds mini disk backup records that can, in turn, be fed into the backup cycle."

Users Wanted Flexibility

What Kral found was that users wanted more flexibility in the backup routine, which would enable them to encode certain IDs or to not back up other IDs. "They used to run the utility and then go in and delete the ones they didn't want to back up, or put options on certain ones."

Through market research, the firm identified the major modifications that users were making. "We came up with a technique that would allow us to specify an additional file to be put into this process, and we termed that an exception file. It allows you to define exceptions to the general rule."

The specifications were brought to Michael Crick, an independent consultant based in Bellevue, Wash., who specializes in the APL language. The requirement was that it be written in assembler and be a stand-alone program.

Complex Program

Recognizing the program's complexity, because it had to detect a number of possible error conditions, Crick decided that his first step should be to confirm VM Software's requirements for the program. "So rather than start right in and write the assembler program, I thought this would be a marvelous opportunity to write this in APL," he explained.

Using APL, he felt he could develop a running program within several days that he could show to VM Software. Once he was certain it provided the results they were seeking, he would translate the program into assembler.

It took him about four days to write the APL program. After VM Software made some adjustments to the program design, Crick spent about three additional weeks translating the program into assembler. "If I hadn't spent that four days

(Continued on Page 36)

Version 4.1 of 'Panexec' Adds 'Abend-Aid' Interface

OAK BROOK, Ill. — Pansophic Systems, Inc. has announced the release of Version 4.1 of its IBM OS version of the firm's Panexec management control package. Panexec runs on IBM and plug-compatible mainframes under OS/MVS and DOS/VSE.

Highlights of the new release for OS systems include a facility that provides an interface with Abend-Aid, proprietary software from Tomark, Inc. which is marketed by Compuware Corp.; support of 3375 direct-access storage device for Panexec libraries; OS partitioned data set and sequential file processing; and program temporary fix maintenance.

Panexec ranges in price from $12,500 to $19,500, according to the vendor.

Pansophic is based at 709 Enterprise Drive, Oak Brook, Ill. 60521.

Allows Access to Data Base

DBMS' 'IDMS Toolkit' Enhanced

NAPERVILLE, Ill. — Another addition to Cullinane Database Systems, Inc.'s Integrated Data Base Management System (IDMS) Tool Kit has been announced here by DBMS, Inc. DML/Online is an interactive software productivity tool that enables programmers, data base administrators and information managers to access an IDMS data base for update or retrieval, according to a vendor spokesman.

With this software, programmers can enter all IDMS Data Manipulation Language (DML) commands on-line for immediate execution, the spokesman noted.

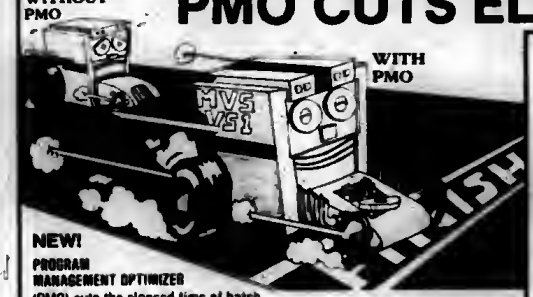
DML/Online software also is said to feature full-screen display on all IBM 3270 models as well as the 3279 color display, program function keys that can be set to designated commands and comprehensive documentation including a user reference manual and a reference card.

The complete IDMS Tool Kit set includes a Journal Analyzer, Data Base Audit, Schema Mapper, Formula/1, Log Analyzer, Data Base Reorganization and now DML/Online. It sells for $13,900 for DOS/VSE environments or $15,900 for OS/VS environments, according to the spokesman.

DML/Online may be purchased separately for $12,500.

DBMS, Inc. is located at 1801 A Mill St., Naperville, Ill. 60540.

PMO CUTS ELAPSED TIME!



NEW!
PROGRAM MANAGEMENT OPTIMIZER (PMO) cuts the elapsed time of batch jobs and online transactions in MVS or VS1 operating systems. PMO greatly reduces I/O contention to critical datasets, saving you time and money.

With PMO, you set records! PMO maintains performance statistics as part of its normal operations. They are available in online display or as hardcopy.

PMO requires no system modifications or user program changes. It goes up in minutes. NO IPL is required for installation or updating.

PMO has saved many users countless hours of unnecessary directory searches. Let PMO put you first across the finish line with the fastest elapsed time!

SHARED DEVICE MANAGEMENT SYSTEMS

DUQUESNE SYSTEMS SHARED DEVICE MANAGEMENT PRODUCTS provide a comprehensive solution to the problems caused by sharing data and devices. You get all of the benefits of interaction between two or more computer systems without all of the problems.

SCON — SUPERCONSOLE (SCON) helps improve operating systems productivity in MVS multi-CPU installations. By providing one console image for multi-system environments, SCON lets an operator monitor a single stream instead of many, reducing hardware and people costs!

SDSI — SHARED DATASET INTEGRITY (SDSI) overcomes integrity problems and reserve lockouts on shared DASD without system or program modification! SDSI protects data against concurrent update and eliminates device reserves with no user program changes.

STAM — SHARED TAPE ALLOCATION MANAGER (STAM) manages your shared device pool with automated allocation. STAM eliminates the need for manual control and provides the ability to share tape drives and mountable disks.

DUQUESNE SYSTEMS INC
SYSTEM SOFTWARE LEADERS SINCE 1970

To find out why the most knowledgeable DP installations rely on DUQUESNE SYSTEMS' Products . . .

Please send me information on:
☐ PMO ☐ SCON ☐ SDSI ☐ STAM
Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Tel _____ Operating System _____

30 DAY FREE TRIAL!

HP 3000
HARDWARE AND SOFTWARE

ACCOUNTING
- Payroll, Personnel
- Labor Distribution
- Accounts Receivable
- Accounts Payable
- Fixed Assets
- General Ledger

INTEGRATED MANUFACTURING
- Order Entry
- Material Requirements Planning (MM/3000)
- Inventory Control
- Shop Floor & Capacity Control
- Job Cost Reporting

DISTRIBUTION
- Order Entry
- Multi-Warehousing
- Shipping—Billing
- Accounts Receivable
- Replenishment Planning
- Distributed Processing

DISCOUNTS AND LEASING
- Up to 24% volume discounts on HP hardware-software systems sales
- Leasing available for hardware-software system sales

DATA SYSTEMS for INDUSTRY

MTI stocks 'em all for faster delivery.

VIDEO TERMINALS

	MTI Price	12 mo. Lease
VT 100 DECscope	$ 1195	89
VT 180 Personal Computing Option	2395	199
VT 101 DECscope	1195	76
VT 131 DECscope	1745	101
VT 132 DECscope	1995	105
ADM 3A (dumb terminal)	595	59
ADM 5 (dumb with visual attributes)	645	59
ADM 31 (two page buffer)	1695	89
ADM 21 (full editing/visual attributes)	690	62
ADM 32 (ergonomic ADM 31)	*	80
ADM 36 (DEC system terminal)	*	90
ADM 42 (8-page buffer available)	*	150
TI 940 (high performance, 1-page buffer)	1690	125
Hazeltine Esprit	575	59
Hazeltine Executive 80 Model 20	1345	88
Hazeltine Executive 80 Model 30	1695	109
Hazeltine 1500 (dumb terminal)	625	75

GRAPHICS TERMINALS

VT 125 (DEC ReGIS firmware)	3290	199
VT 100 (Tektronix 4010 emulation)	3250	189
ADM 3A (Tektronix 4010 emulation)	1795	149
ADM 5 (Tektronix 4010 emulation)	1945	152
VT 100 w/TI 810 plot. (Tektronix emu.)	5920	*

300 BAUD TELEPRINTERS

LA 34 AA DECwriter IV	1095	78
Diablo 630 RO (letter quality)	2295	152
Diablo 630 KSR (letter quality)	2695	175
TI 743 (portable thermal printer)	1190	98
TI 745 (port./built in coupler)	1489	99
TI 785 (port./bubble/built coupler)	2595	174

600 BAUD TELEPRINTERS

Epson MX-80	$46	n.a.
TI 825 KSR impact	1570	104
TI 825 KSR pkg.	1795	125

1200 BAUD TELEPRINTERS

Epson MX-100	$ 895	n.a.
LA 120 RA (receive only)	2095	137
LA 120 AA DECwriter III	2295	147
LA 100 RO letterprinter	1937	136
LA 12-A (port./modem/coupler)	2840	171
TI 763 (portable thermal printer)	1645	118
TI 765 (port./built-in coupler)	2270	135
TI 787 (port./internal modem)	2595	155
TI 810 RO impact	1545	89
TI 810 RO pkg.	1795	107
TI 820 RO impact	1850	120
TI 820 RO pkg.	2025	129
TI 820 KSR impact	2025	129
TI 820 KSR pkg.	2195	137
Lear Siegler 310 ballistic	1945	144

2400 BAUD

Dataproducts M 200 (2400 baud)	2910	198

DATAPRODUCTS LINE PRINTERS

B 300 (300 lpm Band Printer)	5495	426
B 600 (600 lpm Band Printer)	6930	510
B 1000 (1000 lpm Band Printer)	11330	*
BP 1500 (1500 lpm Band Printer)	19700	*

(Controllers available for most minis & micros)

ACOUSTIC COUPLERS

A/J A242-A (300 baud orig.)	242	16
A/J 247 (300 baud orig.)	315	20
Vadic VA 3413 (300/1200 orig.)	845	54

MODEMS

GDC 103A3 (300 baud Bell)	395	30
GDC 202S/T (1200 baud Bell)	595	49
VA 3213 (Bell 212-A comp.)	825	54
VA 3451 (orig./ans. triple modem)	895	54
VA 3455 (1200 baud orig./ans.)	770	54
VA 2460 (Bell 201 comp.)	725	54
VA 103 (300 baud modemphone)	235	19

*Please call for quotation.

Ask about our "QED" discounts. Visa & MasterCard orders accepted. All lease prices include service (within 50 miles of service center). Other lease and ownership plans available. Call MTI today and save.

New York: 516/621-6200, 212/767-0677, 518/449-5959
Outside N.Y.S.: 800/645-6530
New Jersey: 201/227-5552
Ohio: 216/464-8688

CALL FOR LATEST PRICE REDUCTIONS

mti

Applications Specialists & Distributors, New York, New Jersey and Ohio.

TI Ups Speed, Capacity, Performance of Dnos

AUSTIN, Texas — Texas Instruments, Inc. has announced an enhanced version of its multiuser, multitasking, disk-based Dnos, which reportedly provides users of its mid to upper range of commercial minicomputers with increased speed, capacity and performance.

speed, capacity and performance.

The vendor also released e Dnos Performance package that incorporates the Dnos Cobol Plus package, which uses TI's 990/12 processor to provide faster execution of Cobol programs under Dnos. The performance package consists of enhancements that were made for Dnos by utilizing the writable control store microcode feature of TI's 990/12 processor and a new version of Cobol Plus.

The enhancements to Dnos include developmental and operational support for Cobol, Pascal and Fortran-78, the vendor noted. The operating software also supports productivity eids thet include query, sort/merge, TI's Tiform screen-handling tool, e data dictionary and Tipe, TI's word processing package.

To facilitate use of Dnos, the operating environment reportedly now enables users to enter commands or prompts into either edit or command mode in uppercase, lowercase or any combinetion. In addition, the Dnos text editor now can edit records of up to 240 characters. Also included in the text editor is a word-wrap feature and an exclusive edit feature designed to prevent several people from trying to edit a single file et the same time.

Dnos 1.1 end the Dnos Performance package are scheduled for customer shipment in the third quarter of 1982. The enhanced version of Dnos is available free of charge to current customers who have an up-to-date maintenence subscription. Otherwise, the license fee for Dnos is between $4,000 and $4,800, depending on the configuration. The fee includes maintenance for one year. Subsequently, the maintenance subscription fee ranges from $800 to $1,200, depending upon the configuration.

The Dnos Performance package carries e license fee of between $2,000 and $2,800, depending on the configuration. This includes one year of subscription support. Thereafter, the annual fee for maintenance is between $600 and $1,200, depending on the configuration.

TI can be contacted through P.O. Box 202146, Attn: H-623, Dallas, Texas 75220.

Business Units Get Order Entry

NORTHBROOK, Ill. — An Order Entry and Invoicing software package is currently availeble from General Binding Corp. (GBC) for its GBC System 9 and System 12 small business computers.

The software package reportedly functions as either e stand-alone system or as an integral part of the total GBC Business/Financial System. It was designed to store information on customers, orders and products, permitting terminal entry to a central file. It retrieves the status of orders and provides e multilevel finished goods/inventory file, according to the vendor.

According to tha vendor, other features include inquiry capability, tax collection and reporting facilities, automatic credit limit checking, receivebles posting, inventory updating and invoicing.

The Order Entry and Invoicing package costs $599, the vendor said from One GBC Plaza, Northbrook, Ill. 60062.

APL*Plus A Time-Saver

(Continued from Page 35)

with APL it probably would have taken me five weeks. It would have been e much more painful process," he recalled.

"This way the customer knows pretty much exactly what he wants. The APL was so easy to change. There was no feeling that one couldn't change it without e lot of work," he added.

Because this application involved records that included character fields, numeric fields and both fixed- and variable-length fields, Crick decided to use the nested arrays extension to STSC's APL*Plus product which, et that time, was available in only e test version. The nested arrays facility was designed to allow e single expression to link both character and numeric data.

Because the application required matching of records, Crick used the APL operators included with the nested errays extension. Instead of having, for example, 14 logical entities that required 14 operations for uniform data manipulation (which would have been necessary with standard APL), Crick was able to store the entities in a single nested array.

"Then I could treat the records as a vector of 14 scalars and do large amounts of manipulation et once across the entire array. This turned out to be very nice. I think it is one of the biggest advantages of APL," he said.

Rather than making the APL language more complicated, Crick said that the nested arrays extension actually makes it easier by removing a number of restrictions to the language.

Crick said he does most of his consulting work, which involves exclusively business applications, using APL. "It is e very terse language, which allows you to write code without e greet deal of effort. Also, it has extremely good debugging capabilities. Once you have written it, it is very easy to find what the problem is.

"I have some very large APL systems that would be an order-of-magnitude larger product in another language, such as Cobol or PL/I. In fect, they would be beyond the scope of the entire system," he edded.

Using most teleprocessing monitors is like playing the piano.

Years of practice, continuous tuning and maybe you'll get it right.

Before ordering just any teleprocessing monitor for your 4300, make sure you understand the score. Getting most teleprocessing monitors to play will take weeks of installation effort. Composing a fully orchestrated application can easily stretch over a year. Keeping most teleprocessing monitors in tune with your changing requirements will demand the full-time support of an experienced systems programmer. And to prevent the wrong notes in untested programs from ruining your performance, you'll need separate test and production systems.

If this isn't music to your ears, consider a COM-PLETE alternative. COM-PLETE from Software AG integrates all teleprocessing functions into one incredibly easy to use package. Installation takes no more than a day. Applications that would take 1–2 years to develop with most teleprocessing monitors can be completed in 1–2 months with COM-PLETE.

All COM-PLETE facilities are independent of your operating system and terminal devices so they adapt automatically to changes in system hardware and software. A built-in storage protection feature eliminates the need for separate test and production systems. And COM-PLETE can be combined with our ADABAS data base management system to give you a completely integrated data base/data communications system.

COM-PLETE has everything you need to assure virtuoso teleprocessing performance from your 4300 running under OS or DOS/VSE.

Use this coupon to arrange for a free lesson.

software AG
OF NORTH AMERICA, INC

Software AG of North America, Inc.
11800 Sunrise Valley Drive, Reston, Virginia 22091
(703) 860-5050

☐ I would like a free COM-PLETE lesson.
☐ Please send me information on your free seminars.

Name _____
Title _____
Company _____
Address _____
City _____ State _____
Zip Code _____ Telephone (____) _____
CPU _____ Operating System _____ Release _____

CW0712

'Docu/Master' Gets Vsam Support for FBA

NORWALK, Conn. — TSI International has announced the addition of IBM Vsam support for its Docu/Master on-line document storage and retrieval system.

With Vsam support Docu/Master's capabilities reportedly have been extended to all IBM systems with fixed-block architecture (FBA) disk devices, including the 4300 line.

Docu/Master operates on IBM 370 and compatible hardware under DOS and OS. The on-line version is said to be available for use with CICS or as a "bundled" system with TSI's teleprocessing monitor, Task/Master. Docu/Master is compatible with TSI's Key/Master on-line data entry package.

For OS systems, Docu/Master costs between $13,500-$30,000. For DOS systems, the price ranges from $10,000 to $22,500. TSI is located at 50 Washington St., Norwalk, Conn. 06854.

'Adas' Adds 3375 Support

BROOKFIELD, Conn. — Universal Software, Inc.'s automatic disk space manager for IBM DOS/VS and DOS/VSE operating systems has recently added support for IBM 3375 disk drives.

Adas reportedly acts as a productivity tool that enhances CPU capabilities and optimizes Dasd utilization.

The product can be leased for $200/mo and is available for free in-house evaluation.

Universal Software is located in the Brookfield Office Park, Brookfield, Conn. 06804.

'Capasset' Fits System/24

FULLERTON, Calif. — A Capital (Fixed) Assets System designed for the IBM System/34 is available from American Business Computer Systems.

The on-line, menu-driven Capasset package features full-screen edit checking and user friendliness. The software is said to permit nine depreciation methods, including four 1981 Accelerated Cost Recovery System methods.

The system tracks assets, performs monthly/yearly book and tax depreciation, provides month-end/year-end reports, permits depreciation expense modeling for one to 20 years in the past or future and contains an on-line user guide to the system.

The one-time charge ranges from $2,750 to $3,950, depending on options, with a 30-day money back guarantee. On the East Coast, the software is available from Mincron SBC Corp., Suite 2810, 350 Fifth Ave., New York, N.Y. 10118. American Business' address is 2515 E. Santa Fe Ave., Fullerton, Calif. 92631.

'Umbrella System' Goes Stand-Alone

DALLAS — Hogan Systems has announced that its Umbrella System software is now available on a stand-alone basis for the commercial marketplace. This product was formerly a part of the firm's banking software product line and runs on IBM mainframe computer systems and plug-compatibles, according to the vendor.

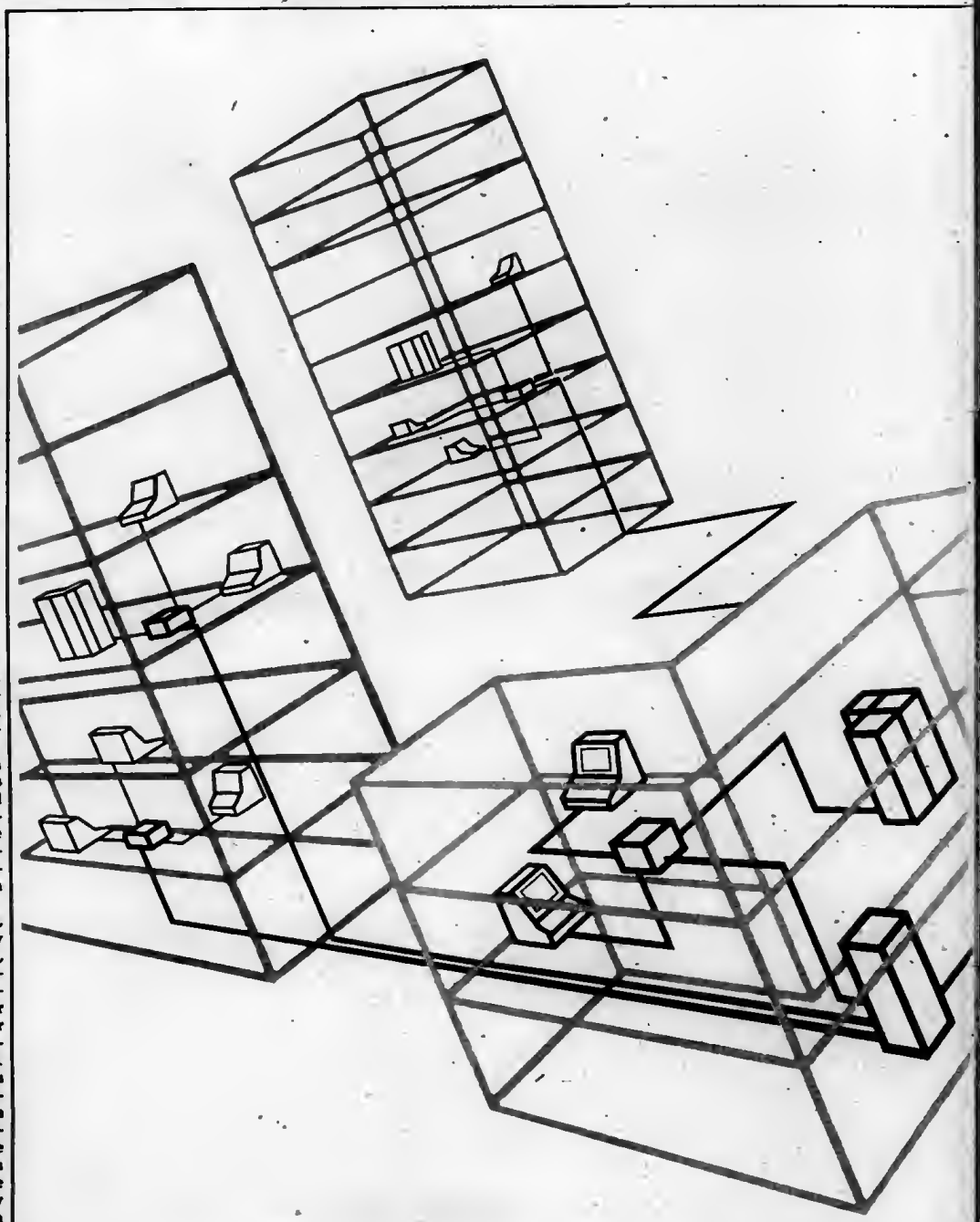
The Umbrella is an integrated structure consisting of several approaches to developing and maintaining application systems, according to the vendor.

Entries in the Umbrella processing dictionary determine program code execution, the sequence of execution and the relationship between the logical environment, built for the programs by the Umbrella, and the real environment, a vendor spokesman said.

Another feature of the Umbrella structure is the ability for on-line control and tracking of all enhancements, fixes, changes and new products. Reports for management are available by project, system or by individuals, the vendor said.

The Umbrella System sells for $150,000, according to the vendor.

Hogan Systems can be reached at Suite 400, 14951 Dallas N. Pkwy., Dallas, Texas 75240.



Innovative Data Processing Announces Price Hikes

CLIFTON, N.J. — Price increases on three products were announced here by Innovative Data Processing.

The cost of Version 4 of the company's Automatic Backup & Recovery software will go up from $5,000 for a license to $6,000. The Fast Analysis of Tape Surfaces system will jump from $2,500 to $3,000, and the Fast Analysis of Tape and Recovery will inflate from $1,500 to $2,000.

These products run on IBM OS, VS and MVS systems and plug-compatibles, according to the vendor. Price hikes will take effect Sept. 1, the vendor said from 970 Clifton Ave., Clifton, N.J. 07013.

Adds On-Line Audit Trail

On-Line Librarian Updated

MEMPHIS, Tenn. — An on-line audit trail for source code libraries that is said to track library changes and who made the change is available in a new release of Marian, the on-line librarian from Computer Software Unlimited.

While earlier versions of the software offered ways to isolate problem-causing program changes, Release 4.0 also reportedly provides for summaries of program changes in management reports as well as on-line displays.

Another improvement to the audit trail is the addition of session codes to the librarian's capacity to isolate member changes by date or date range. Marian, which runs on IBM 360, 370 and 4300 equipment, costs $8,000.

Rental and lease-purchase plans are available from 1806 Malabar Drive, Memphis, Tenn. 38138.

Financial System Aims at Hospitals Using IBM 4300s

NEW YORK — Health Information Systems, Inc. (HIS) has announced the availability of its customized financial information management system for users of IBM 4300 systems in hospital data processing systems.

The HIS system includes registration, admission, discharge and transfer, inpatient and outpatient billing and accounts receivable management, accounts payable, management, general ledger, fixed assets, forecasting and modeling, purchasing and materials management and payroll and personnel components. These reportedly are integrated into an in-house computer system and were designed to manage the financial administration of a health care facility.

The HIS system for IBM computers reportedly is compatible with all standard IBM operating systems and will be available for the 4300 series in the fourth quarter of 1982.

It is said to be compatible with the IBM Patient Care System and can be interfaced to IBM's IMS-DL/1 data base management systems and other existing data base systems.

The entire system can be developed for between $1 million and $2 million, the vendor said, noting that the cost is based on the types and extent of modifications required.

Further information is available from HIS at 4522 Fort Hamilton Pkwy., Brooklyn, N.Y. 11219.

Survey Analyzer Enhanced

EAST LANSING, Mich. — Standard Research, Inc. has announced enhancements to the Prime Computer, Inc. and IBM System/34 versions of its market survey analysis tool.

Release 2.2 of RPX Tab is said to contain extended cross-tabulation and frequency capabilities as well as new multiple-response features.

RPX Tab is available for single-site lease or through time-share access. Purchase price for the Prime version is $15,000; $7,000 for the System/34 version, the vendor said from P.O. Box 151, East Lansing, Mich. 48823.

Our New Local Network Grows On You.

Growth potential is a subject most Local Area Network suppliers would like to avoid. But M/A-COM LINKABIT's new IDX-3000 Local Communication Network is a happy exception. Because it starts out with a throughput capacity of 400 Mbps.

IDX-3000 . . . the low-cost local network that can grow from hundreds of users to thousands in a multi-location environment.

IDX-3000 . . . the low-cost local network that can grow from a single communications task to a comprehensive multi-function system.

IDX-3000 . . . the local network whose economic advantages start with installation savings, and grow to include virtually every phase of operation.

The IDX-3000 Local Communication Network. We built in growth potential instead of limitations.

And we're ready to deliver one to you.

For more information, call or write: IDX-3000, Dept. CW-02, M/A-COM LINKABIT, Inc., 3033 Science Park Road, San Diego, CA 92121. (714) 457-2340.

M/A-COM LINKABIT, Inc.

M/A-COM

Hewlett-Packard on Data Processing ROI

You're paying your EDP people 17% to make them 500% more productive.

more this year. But there's a way

That 17% isn't just an estimate. It comes from a survey of EDP departments across the country, taken by *Computerworld* in December, 1981.

There's nothing blue-sky about the second figure, either. That 500% gain in productivity was reported by Dick Hamilton, an independent contractor who develops programs for Weyerhaeuser Company. He's been able to write new applications 5 to 20 times faster, because the programmer productivity tools we've designed for our HP 3000 computer system are so efficient.

Programmers save time.

The 500% increase we mentioned is just one example. We've seen our tools deliver results like these time and time again. In every area of EDP activity. From outlining new projects in much less time, to eliminating countless numbers of programming steps, to cutting software maintenance costs in half.

But whether you spend 10 months or 10 days developing a new application, it's a valuable asset to your company. And clearly, the best way we can increase your ROI is to help you protect that software investment. That's why we design every new HP 3000 to be software compatible with all our earlier models. Which means you can upgrade to a newer, more powerful HP 3000, or add more systems to build a network. Without changing one line of code.

The whole company saves money.

Of course it's important to save money in your EDP department. But it's even more important to make the best possible use of your programmers so they can spend more of their valuable time developing special applications that save money across your entire company. And we have a long list of software tools which help them do just that.

To begin with, your programmers won't have to spend a minute designing applications for word processing, electronic mail, management reporting, or business graphics. We've got off-the-shelf software for all these functions.

Better yet, these user-friendly products make it easy for people with no computer experience to generate management reports all by themselves. They can even produce presentation-quality full-color charts, graphs, and overhead transparencies. Without asking the EDP department for help.

To reduce the backlog even more, we have a number of sophisticated software solutions for accounting, materials management, production management and distribution/inventory control. Plus an aggressive third-party program that brings you over 260 applications designed by experts from a broad range of industries.

A new level of uptime.

You can't sustain an increase in productivity unless your systems are up almost all the time. In fact, ours are so reliable that in 1980 we introduced our Guaranteed Uptime Service. Which states, in a nutshell, that if your HP 3000 system is up less than 99% of the time over a three-month period, your next month's service contract on all covered items is absolutely free. So far, this guarantee hasn't cost us one penny.

To give you this new level of uptime, we give you a total commitment to service. We're sure that's a large part of the reason why HP was ranked #1 for support satisfaction in a recent Datapro survey of 2309 EDP departments. And why our list of 9000 satisfied customers keeps getting longer every day.

We've pulled it all together.

When you take the long view, we're talking about a lot more than EDP budgets, applications, development, hardware reliability, or customer service. What we're offering is a broad approach that uses the power and flexibility of our HP 3000 to run your data processing, office automation, and application development programs. And ties them all together into one efficient, information management network.

We've put together a brochure that can tell you a lot more. It's called Information Management Systems. Just ask your local HP sales office for a copy. Or write John Celii at Hewlett-Packard, Dept. 03141, 19447 Pruneridge Avenue, Cupertino, CA 95014.

HEWLETT PACKARD

47206

Announcing
ICCFAIDS™
An enhanced ICCF* usability tool for **scanning** and **editing** ICCF members available at an introductory price of $500.00.

FOR A FREE THIRTY DAY TRIAL CONTACT:
CSI- 43XX PRODUCTS
a division of
california software, incorporated
1460 fourth street, suite 304
santa monica, california 90401
213/451-5693

*A program product of the IBM Corporation

'Adam' Targets DEC 'RMS,' Allows Simultaneous Access

WRENTHAM, Mass. — World-Wide Computer Resources Ltd. has introduced a software package described as an alternative to Digital Equipment Corp.'s Record Management Services (RMS).

The Advanced Data Accessing Method (Adam) reportedly allows the same collection of records to be accessed in several ways simultaneously. Furthermore, by including within a program only those procedures required for an application, Adam will reportedly use less code than would traditional methods.

The Adam user reportedly can create files, create new accessing paths, maintain records and check on the status of files and their structure.

Aimed at the DEC CTS-300 and CTS-500 operating system and VAX/Dibol language user, Adam costs $2,000. The vendor is located at 15 Trafalgar Square, Wrentham, Mass. 02093.

'Diskit' Gets Enhancements

LOS ALAMITOS, Calif. — Software Techniques, inc. has introduced the latest version of Diskit, the disk management tool kit for users of Digital Equipment Corp.'s PDP-11 system running under RSTS.

Diskit Version 5.0 is comprised of five software products and reportedly includes:

- A disk structuring utility that is said to optimize disk directories and improve system performance.
- A high-speed directory reorder program that improves system performance by reducing the number of disk accesses required to find and retrieve files.
- An ultra high-speed directory (DIR) utility said to search directories at the rate of 400 files/sec. DIR reportedly supports all of the functionality of DEC's Direct and can be used as a replacement for Direct in all applications. According to the vendor, DIR provides a number of features not found in Direct, including tools for improving system security.
- A disk utility subroutines package that reportedly allows system managers to develop their own apecial-purpose disk utilities.
- An open files display program that monitors file accesses on a job-by-job basis.

Diskit Version 5.0 is licensed for single CPUs for a one-time fee of $1,350. Multi-CPU, OEM, educational and quantity discounts are available. Software Techniques is headquartered at Suite 101, 5242 Katella Ave., Los Alamitos, Calif. 90720.

'Ezlog' Extends VAX Log-In

GOLETA, Calif. — Signal Technology, Inc. has announced a user-oriented software extension to the Digital Equipment Corp. VAX/VMS log-in procedure, which reportedly allows the user to specify the project or cost center to charge for the log-in session or batch job.

Called Ezlog, this product also features an optional second level of password protection and records unsuccessful log-in attempts. Other features include the ability to delegate project access to account managers, and disk files can be separated by project or user.

The one-time single-CPU license for this product is $2,200, which includes documentation, installation procedure, one year of maintenance and periodic updates. Licenses for additional CPUs are available on an unsupported basis for $1,320, the vendor said from 5951 Encina Road, Goleta, Calif. 93117.

Introducing Used Software for DEC.

At Data Processing Design we've created the most efficient software systems ever developed for Digital Equipment Corporation's family of minicomputers.

That's because we believe in the concept of used software. Software that is so thoroughly thought-out, so thoroughly tested and debugged, and used in hundreds of sites throughout the world.

Take WORD-11, for example. Nothing less than the most responsive, most popular word processing software in the field, available on VAX/VMS,* RSX-11M,* RSX-11M PLUS,* and RSTS/E.*

We also developed WAFE, a user-oriented file editor, that's done for programmers what WORD-11 has done for the office. Another DPD offering is SAVER, a disk-to-tape backup package for RSTS/E users, currently in use at over 538 sites worldwide.

All we do at DPD is develop the best software that Digital users can find. Nothing more. That's why we're the experts in our field, making life easier for Digital users day after day.

So give us a call at Data Processing Design. If you're not using our software, you're not getting the most out of your Digital hardware.

Software that's designed to be used.

Data Processing Design, Inc.
AUTHORIZED DIGITAL COMPUTER DISTRIBUTOR

CORPORATE OFFICE
181 W. Orangethorpe, Suite F
Placentia, CA 92670
714-993-4160 Telex 182-278

NY OFFICE
420 Lexington Avenue, Suite 653
New York, NY 10170
212-687-0104

WASHINGTON DC OFFICE
4520 East-West Highway, Suite 550
Bethesda, MD 20814
301-657-4098

WORD-11 is a trademark of Data Processing Design, Inc.
VAX/VMS, RSX-11M, RSX-11M PLUS, and RSTS/E are trademarks, and remaining titles are products or trademarks of Digital Equipment Corporation

'FSC-EPS' Debuts for Wang Minis

WINDHAM, N.H. — EPS Consultants, Inc. has announced that its FSC-EPS decision support system is now available for the Wang Laboratories, Inc. VS/50 through VS/100 minicomputers.

The package features financial modeling, "what if" scenarios, simultaneous equation solution, forecasting, editing and advanced programming capabilities.

In addition, the Wang VS version features user-defined commands and functions and increased capabilities for screen formatting.

The package costs $43,000, the vendor said from 1 Industrial Drive, Windham, N.H. 03087.

'Control' Package Enhanced For Wang VS Processors

GARDEN CITY, N.Y. — Loud Consulting Corp. has enhanced its Control portfolio accounting, evaluation and management package for Wang Laboratories, Inc. VS series processors.

The three major enhancements are provisions for accounting in foreign currencies, accounting and reporting on commodity transactions and a tax work sheet to convert foreign currency trades to dollars and to calculate the currency swing for economic gains or losses, the vendor said.

The enhanced package costs $35,000 for a one-time license fee.

Loud Consulting Corp. is located at 666 Old Country Road, Garden City, N.Y. 11530.

Kurzweil's 'Kdem' Gets Training Enhancements

CAMBRIDGE, Mass. — Kurzweil, Computer Products, Inc. has announced several software enhancements for its Kurzweil Data Entry Machine (Kdem), which reportedly scans and converts to digital code 200-plus typestyles in common use.

Among the improvements offered is one that reportedly reduced by 50% the training time for new documents on the turnkey machine. In the new easy mode, the system automatically trains itself to recognize most of the characters in a new document without operator intervention. The software also permits the operator to call a list of "confirmed" characters onto the video screen at any point during the training, according to the vendor, so that the operator knows when the training is finished.

The new software is available on all new Kdem systems, which are base-priced at $59,000 and range upwards to $89,800, the vendor said from 185 Albany St., Cambridge, Mass. 02139.

COMPUTER OPERATIONS

PLANNING EDP EXPANSION? New Site? Modernization of Existing Facilities?

D.P. Facilities Engineers and Designers have 20 plus years of experience to move your facility into the next generation.

- Advance Techniques in Architectural, Engineering and Interior Design.
- Construction Methods & Materials
- Environmental Air-Conditioning
- Uninterruptible Power & Voltage Stabilization
- Fire Detection & Suppression
- Total Security

TIME A FACTOR? Call our D/C expedite group today—for a guaranteed completion date.

(212) 674-8600

D.P. FACILITIES INC., NATIONAL

250 Park Ave. South, N.Y. 10003

SAVE 40% to 70%

Texas Instruments Models

735	$748
745	848
765	1198
733ASR	2198

Refurbished 30 Day Warranty

Call: WESTWOOD 201-376-4242

TEXAS INSTRUMENTS TERMINALS IN STOCK IMMEDIATE DELIVERY

AUTHORIZED DISTRIBUTOR TEXAS INSTRUMENTS DATA TERMINALS

silent 700 — 300 Baud, 1200 Baud

omni 800 — Impact Printers

SALES • LEASES • SERVICE

Also from stock: Hazeltine ADDS, IBM & HP CRTs. Diablo Daisy Wheel Printers Tele-type Decwriters. Sykes Comm-Stor I. Vadic Modems

*bubble memory

Westwood ASSOCIATES, INC.

DATA COMMUNICATIONS EQUIPMENT

25 Route 22 E / P.O. Box 10 Springfield N.J. 07081

Corporate HQ. NJ (201) 376-4242 • NYC (212) 662-0060 • Conn. (203) 932-6383
Phil. (215) 972-0283 • Pittsburgh (412) 881-2590 • Boston (617) 451-6550
Baltimore (301) 368-7812 • Cleveland (216) 476-9336 • Wash. DC (202) 737-0244
Miami (305) 944-1377 • Tampa (813) 862-1890 • Atlanta (404) 394-1037

We bring the best together with our fast new 3-mode printer

Advanced hardware and engineering by Toshiba. Innovative American software and strong sales support. Toshiba America combines them in easy-to-sell products with dealer prices and support tailored to help keep your competitive edge at its sharpest. Here is one example of our many advanced designs, shown with our T250 personal office computer.

P1350 LetterPerfect Printer

Our 3-mode prints letter perfect quality at 100 cps—twice as fast as the others. Prints 160 cps draft quality and its graphic capabilities are picture perfect! Our exclusive 24-replaceable pin printing head means easy, low cost maintenance. For full details, contact your nearest regional office today!

T250

P1350

THE BEST OF TWO WORLDS

TOSHIBA

TOSHIBA AMERICA, INC./INFORMATION SYSTEMS DIVISION

Corporate Office/Tustin, California/(714) 730-5000
Central Region/St. Louis, Missouri/David M. Johnson/(314) 991-0751
Eastern Region/Morristown, New Jersey/Albert J. Connelly/(201) 326-9777
Southern Region/Atlanta, Georgia/Michael J. Hutchinson/(404) 434-3891
Western Region/Irvine, California/Marvin McCurdy/(714) 540-5455

ANOTHER QWIKTERM SPECIAL

TI 765
ONLY $1095
300 BAUD Portable
256K Bubble Memory
Three Month Leases Available

• Boston (617) 246-1665
• Chicago (312) 595-7733
• Los Angeles (213) 417-8003
• New York (212) 564-7731
• San Francisco (415) 461-0923
• Wash., D.C. (703) 522-1210

Micro Notes

Phase One Systems, Inc. has introduced **Oasis-16**, said to bring multiuser capability and business applications to the IBM Personal Computer. The software costs $1,495 from Phase One at Suite 830, 7700 Edgewater Drive, Oakland, Calif. 94621.

Also for the IBM Personal Computer is a word processing software package from Lifetree Software, Inc. **Volkswriter** is written in Pascal and requires 64K of memory, one disk drive and Microsoft, Inc.'s MS DOS operating system for operation. Volkswriter costs $195 from Suite 342, 177 Webster St., Monterey, Calif. 93940.

Aston-Tate has released an enhancement to its dBase II relational data base management system. **ZIP** is a screen builder and report generator that runs on Ascii and Ansi terminals and 8-bit 48K micros under Digital Research, Inc.'s CP/M. Said to allow the dBase II user to bring up applications more quickly, ZIP is free to users of dBase II, which costs $700 from 9929 W. Jefferson Blvd., Culver City, Calif. 90230.

Lifeboat Associates, Inc. has announced an Intel Corp. **8086 Software Library** designed to run on the IBM Personal Computer and on other 8086 computers running Microsoft, Inc.'s MS DOS. Included in the library is Lifeboat's **Emulator/86**, the Digital Research, Inc. CP/M-86 emulator that allows CP/M-86 software to be run on the IBM Personal Computer with DOS. Emulator/86 costs $75. DMA, Inc.'s **EM80/86**, allowing execution of CP/M-80 programs on the IBM Personal Computer under DOS, costs $200 from Lifeboat at 1651 Third Ave., New York, N.Y. 10028.

Standard Computer Systems has announced the availability of a package called **Emulator II**. The package was designed to enable Apple Computer, Inc.'s Apple II microcomputer to act as a conversational CRT with Microdata Corp.'s Reality minicomputer series and other systems based on Pick & Associates, Inc.'s Pick operating system, the vendor said. The package is available at the introductory price of $250 from the vendor at Suite 255, 10300 Sunset Drive, Miami, Fla. 33173.

RR Software has announced an Ada compiler for IBM's Personal Computer. The Ada subset, called **Janus**, reportedly runs and produces code for its host machine. The package requires 96K bytes of memory, two disk drives and the Digital Research, Inc. CPM/86 or 86-DOS operating systems. The compiler costs $400. It is also available for 8-bit CP/M-80 based systems for $300. A user manual costs $25, according to the vendor at P.O. Box 1512, Madison, Wis. 53701.

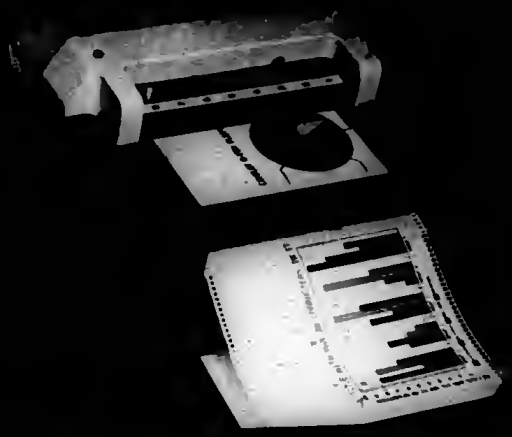
Intelligent Systems Corp. has announced an **Intelligent Graphics System** for the firm's 8000R and 8300R series terminals and desktop microcomputers. The model 8301R terminal costs $3,490. A CP/M-based desktop processor, the Model 8063R with dual 8-in. disk drives and 64K bytes of memory costs $5,700. A graphics desktop workstation with plotter and digitizer costs $11,880, and a graphics desktop workstation with ink-jet printer costs $11,770, the vendor said from Intecolor Drive, 225 Technology Park/Atlanta, Norcross, Ga. 30092.

Apple Computer, Inc. has announced **Quick File III**, a filing package that manages small to medium-size collections of information on the Apple III processor. The package allows users to design forms to special needs, to access many records simultaneously and communicate with the firm's Apple Writer III or other Ascii character files. The package costs $100, the vendor said from 20525 Mariani Ave., Cupertino, Calif. 95014.

Hayden Book Co., Inc. has announced **Pie Writer**, a word processing package for Apple Computer, Inc. Apple II processors. Based on an earlier package offered by Hayden, the program includes enhancements such as a machine buffer and multiple tabbing capabilities. The package also features improved documentation including an index. The package costs $149.95, the vendor said from 50 Essex St., Rochelle, Park, N.J. 07662.

Hourglass Systems has announced three software programs for Digital Research, Inc. CP/M and North Star systems. **Fast Figure** is a spreadsheet program that runs on 46K and costs $110. **Market Time**, a decision assisting tool for investors, requires 34K of memory and costs $70. **High Yield**, a mutual fund investment management tool, runs on 38K and costs $70 from the firm at P.O. Box 312, Glen Ellyn, Ill. 60137.

Eight pens for the price of one



As a special introductory offer, through August 31, 1982, the all new eight pen model of the Houston Instrument CPS-20 will be available for only $4,295*. Imagine it...plots up to 11" x 144", CPS-20 performance and flexibility, and eight microprocessor controlled pens for only $4,295. Compare that to competitive continuous feed four pen plotters costing as much as $8,500!

The Houston Instrument CPS-20 gives you the ultimate in plotter versatility. Our exclusive single board design enables the plotter to be interfaced with virtually any computer (RS-232-C, single or dual port, IEEE-488, Centronics® compatible, and incremental). If you upgrade or change computers in the future, it's no problem. A simple change of the interface boards and the CPS-20 is ready to interface with the new computer.

Don't miss this unique opportunity. The special introductory offer ends August 31.

For complete details, contact Instruments and Systems Division, P.O. Box 15720, Austin, Texas 78761. (512) 835-0900. For rush literature requests, outside Texas call toll free 1-800-531-5205. For technical information, ask for Operator #5. In Europe, contact Instruments and Systems Division, Rochesterlaan 6, 8240 Gistel, Belgium. Phone 059/27-74-45.

INSTRUMENTS & SYSTEMS DIVISION
Together...we'll create tomorrow.
BAUSCH & LOMB

*U.S. domestic price only
® Registered trademark of Centronics Data Corporation

Vendors' Decision To Endorse Protocols Developed by Ecma Taps Mixed Feelings In 802 Committee

Maris Graube, chairman of the IEEE 802 Local Area Networks Standards Committee, is "overjoyed."

Kenneth G. Bosomworth, president of International Resource Development, thinks it might not matter.

Other 802 Committee members are undecided.

The event that failed to unify their opinions is a recent announcement by 19 vendors — only six of them U.S.-based — to endorse a set of Ethernet-compatible local-area network protocols developed by the European Computer Manufacturers Association (Ecma) [CW, July 5].

Asked if the announcement amounted to a willingness by vendors to bypass the 802 Committee in favor of quicker results, Graube replied in the negative. "It certainly lends weight to what we're doing," he commented. "If we already know we have support in Europe and Japan, then we're well on our way to achieving an international standard."

The Ecma and 802 positions are "very close together," according to Graube. He said the only difference the two organizations have is a minor one having to do with data security.

In the Ecma scheme, it is remotely possible that a single bit error introduces a nondetectable error, the chairman said, adding that 802 maintains there is a different technique to correct for that and Ecma asserts it is not worthwhile.

Ecma and 802 have worked closely together on the protocols, attending each other's meetings and exchanging documents. "What we're really trying to do is achieve international standards for local-area networking and that's what's happening," Graube declared. "If we've been a party to it, that's a feather in our cap."

When Bosomworth was asked if the 802 Committee would perceive the vendors'

(Continued on Page 46)

Contelnet Said to Fit Multiple Vendors

GREAT NECK, N.Y. — A local-area network designed to interface with multiple vendors' equipment was announced recently by Contel Information Systems, headquartered here.

The standard version of the Contelnet reportedly employs baseband transmission, but the system can be changed to broadband by installing a new circuit board in the bus interface unit (BIU) and adding amplifiers to the cable, the company said. Other key features of Contelnet:

- The network can operate at 2M-, 5M- or 10M bit/sec in either baseband or broadband mode.
- The standard version of Contelnet employs Carrier-Sense Multiple Access/Collision Detection, but token passing can be implemented "with certain software modifications."
- Up to five subnetworks can be supported by Contelnet in the broadband mode.
- Gateway connections to Ethernet, as well as to packetized and analog long-distance networks, are provided.

The network is said to consist essentially of a single coaxial cable that interfaces with user stations through BIUs; a network control center that performs diagnostic/maintenance functions and manages downline loading, upline dumps, network reconfiguration, display control and related chores.

The cable has a bandwidth of 295MHz and reportedly is divisible into 6MHz channels; each of which can support 255 nodes. Up to 64 virtual circuits can operate through each node.

The four-port model of the Contelnet BIU is priced at $2,000 in its simplest baseband configuration. Other BIUs are priced below or above that figure, depending on the number of ports to be served and the characteristics desired. Prices for the net control center start at $15,000, including software.

Contel expects to begin installing the first Contelnets in the fourth quarter of this year, a spokesman said from 130 Steamboat Road, Great Neck, N.Y. 11024.

For IBM System/34, 38 Users

Terminal-Switching Software Debuts

SAN JOSE, Calif. — Systar Corp. has unveiled remote terminal-switching software for users of IBM System/34 and /38 computers.

The Network 34/38 reportedly allows those users to create networks of IBM 5251 terminals and printers capable of accessing any of up to seven different host System/34 or /38 computers connected to a single Network 34/38.

The remote terminal-switching system is a communications front end that runs on an IBM Series/1 minicomputer. It reportedly supports up to seven multidrop leased-line networks of 5251 terminals and printers. Each terminal or printer user selects the desired host computer system from a menu presented by the device and proceeds to sign on to the host in the usual manner.

Users may switch from host to host and will appear as normal, active or inactive workstations in a multidrop private-line network. Network 34/38 is Systems Network Architecture-compatible and no changes to application or system software are required, the vendor claimed.

It can be combined with Systar's Gateway 34/38 for access to System/34 and /38 computers from Ascii asynchronous terminals such as the IBM 3101, Texas Instruments, Inc.'s 940 and IBM's Personal Computers.

Network 34/38 is available for a one-time license fee of $40,000, which includes support for multiple hosts and networks and network control, Systar said from Suite 208, 1762 Technology Drive, San Jose, Calif. 95110.

- Integral RJ11 Jack for Telephone
- Voice/Data Switch on Front
- LED Carrier and Data Indicators
- EIA and Optional Current Loop Interface
- Small Size: 4x5x1½ Inch

YOUR CHOICE!

Two choices from our family of 300 Baud Bell 103/113 compatible modems.

Choose one and send coupon for more information.

- Integral Modem and Telephone
- Pushbutton Dial on All Lines
- Auto Dial of Stored Number
- Auto Voice/Data Switch
- Auto Disconnect
- Auto Answer — $60 Additional
- LED Carrier, Ring, Data and Mode Indicators

305E2-12 modem $147.00 ☐

☐ $277.00 370E2-12 phonem

☐ Acoustic Couplers ☐ Medium Speed Modems ☐ High Speed Modems
☐ Time Division Multiplexers ☐ Frequency Division Multiplexers

Please check items of interest and return to us for additional information

ComData
We can get you there from here.
7900 N. Nagle
Morton Grove, IL 60053 312/470-9600
New York 212/267-3696
Los Angeles 213/624-0560
member of IDCMA

name ____
company ____
street ____
city ____ state ____ zip ____
telephone ____ ext. ____

Financial Institutions Get Modular Service Stations

DAYTON, Ohio — NCR Corp. has announced a series of modular administrative and teller service stations — the Branch Automation System (BAS) 5000.

Designed for financial institutions, the modular units include a branch processor, two controllers, three screen-based displays, three keyboards, three printers, a personal identification number key pad and a magnetic-strip card reader.

The firm also announced the Transaction Management Executive, a specialized operating system for the series.

The BAS 5000 can operate with previously released NCR self-service automated teller machines and the firm's line of item processing systems, a spokesman for the vendor said.

System prices vary according to modules selected. A typical configuration with a 12-in. CRT terminal, an 111-key alphanumeric keyboard and letter-quality printer costs $5,700. Configurations for teller stations using a 9-in. CRT terminal, a 44-key printer and a journal-validation printer costs $4,300. Deliveries are slated for the second quarter of 1983, the vendor said from Dayton, Ohio, 45479.

Dial-Up Networks Get Bell-Compatible Modem

ROCKVILLE, Md. — The Data Communications Division of Penril Corp. has introduced a Bell Laboratories, Inc.-compatible modem, which reportedly operates at 2,400 bit/sec. for use on the dial-up network.

The Penril 8201 DN modem reportedly conforms to CCITT Recommendation V-26 and provides backup operation at 1,200 bit/sec. The modem can be directly connected to the public telephone network, operates half-duplex or simplex and was designed to directly interface with Penril's 8801C Automatic Calling Unit. The 8201 DN is equipped with a scramble/descrambler, an equalizer to improve operational performance and diagnostics to isolate fault conditions, the vendor said.

It lists for $895 in single quantities. Penril is located at 5520 Randolph Road, Rockville, Md. 20852.

Ecma Protocols Gaining Support

(Continued from Page 45)

action as a slap in the face, he replied, "I think the IEEE 802 Committee must be sufficiently accustomed to slaps in the face at this point in time so that this particular slap in the face won't be particularly noticeable."

He said that the committee's decision not to adopt the Ethernet protocol was "pretty childish" and went on to say that the entry of IBM and AT&T into the local-area network market may render the 802 Committee's work meaningless.

As he put it, "IBM doesn't have any intention of going along with anybody else's standards. They've published enough of their baseband standards to make that quite clear." Owing to political reasons, there is no way AT&T would use the same standards as either IBM or Xerox, which sells Ethernet, he added.

What the announcement made clear is that there are now three important standards, he said: two unannounced ones from IBM and AT&T and the emerging Ethernet/Ecma offering.

Charlie Bass, vice-president of Ungermann-Bass, Inc., thinks time is running out for the 802 Committee. Ethernet-compatible large-scale integration interface chips will be out this July, and the committee had better endorse Ethernet or come up with a compelling reason not to, he said.

As far as IBM and AT&T are concerned, according to Bass, Bell may adopt either an IBM or Ecma/Ethernet local-area network technology. "Ecma/Ethernet may not even counterbalance IBM, but it will be devastating to any splinter position," he commented.

Paul Weinwright, who has been working on internetworking aspects with the 802 Committee, said that body has tried to be in as close agreement with alternatives to its work as possible. The committee will probably try to coma in line with the Ecma standard, he noted.

"I would think we would try to work together to have a compatible set of standards," he added.

Robert Donnan has been working on token-passing ring topology problems with the 802 Committee. He called the vendor/Ecma announcement "interesting." He was uncertain if it indicated a willingness by the vendors to scrap the committee's efforts.

Donnan said Ecma has moved forward on standards faster than the 802 Committee because it represents a smaller constituency of only 15 companies. "If I were an Ethernet-type-of-guy and here was a standard that was now in place, and if it fit what I wanted to do, I would stand up and support it," he said.

"The proliferation of financial planning languages will create chaos throughout corporate management ranks. In the future, we will see one standard modeling language that extends from the personal desk-top computer to the central corporate information center."

G. R. Wagner, Ph D
Chief Executive Officer
Execucom Systems Corporation

Execucom is not in the business of catching up or staying put.

Nor are most of the executive-managers that we know. That's precisely why our leading-edge technology has provided IFPS®, the Interactive Financial Planning System. Financial planning becomes easier. More alternatives can be considered. Assumptions are more clearly understood and decisions are based on better information.

IFPS is now in its eighth enhancement and will continue to improve as it makes your people more productive and your company a better place to work.

Execucom will also continue to meet the challenges of the future as we develop the tools that will bring order to the chaos.

If you'd like more information, call toll free 1-800-531-5038, in Texas call 512/346-4980, or send the coupon to: Execucom, P.O. Box 9758, Dept. CW9-I, Austin, TX 78766-9758.

I'd like to know more about the leader in Executive Mind Support. Please send more information about IFPS and related products.

Name
Title
Company
Address
City
State Zip
Telephone

EXECUCOM

Supporting the mind with knowledge through technology.

Tektronix Enhances Models 4052, 4054

BEAVERTON, Ore. — Tektronix, Inc. has introduced enhancements for its Models 4052 and 4054 graphics desktop computers that are said to make them more useful in scientific and engineering environments.

The new versions of these products, called the 4052A and 4054A, include such features as improved Basic language, more powerful general-purpose interface bus and high-resolution, 11-in. by 19-in. direct-view storage tube displays.

The firm has also introduced an Extended Memory File Manager, which supports the 4050 Series. A random-access memory option, the file manager reportedly has a capacity of 256K bytes or 512K bytes. The options allow up to nine data files to be open for access. The device supports sequential or random access to Ascii and binary program or program segments, the vendor said.

The 4052A is priced at $9,900; the 4054A for $20,100; the file manager is priced at $3,500 for 256K bytes and $4,500 for 512K bytes.

Tektronix can be reached through P.O. Box 500, Beaverton, Ore. 97077.

Imlac Workstation Runs On Anvil-4000 CAD/CAM

NEEDHAM HEIGHTS, Mass. — Imlac Corp. has announced an Intelligent Interactive Display/Workstation (IID) designed for use with Manufacturing and Consulting Services, Inc.'s Anvil-4000 computer-aided design and manufacturing (CAD/CAM) software.

Imlac's 1600 IID workstation consists of a 19-in. diagonal graphics terminal, a graphics tablet, 192K bytes of random-access memory and 64K bytes of erasable-programmable read-only memory, plus an RS-232 interface to the host computer.

According to Imlac, the 1600 IID relieves the host computer of most of the interactive requirements of Anvil-4000, allowing the number of terminals supported by a host computer to double, while maintaining instantaneous interaction regardless of the line speed used to connect to the host.

The 1600 IID is available for $23,700 from Imlac, 150 A St., Needham Heights, Mass. 02194.

System Aids Logic Engineers

SANTA CLARA, Calif. — Calma Co. has introduced a computer-aided design system for logic engineers. The Engineering Workstation offers a full virtual-memory system that supports multiwindow processing and full-screen viewing with user-definable windowing capabilities.

The system also has a hierarchical data base to allow design and functional graphics that support on-screen menus and help files. It includes networking capabilities that allow designers working on a schematic design to accesss the same data.

A two-node configuration costs $135,000 for two 32-bit computers, each with 1M byte of virtual memory, a 19-in. black-and-white display terminal and a 1.2M-byte floppy diskette. Calma is at 5155 Old Ironsides, Santa Clara, Calif. 95050.

University Sidesteps Inflation by Operating Nonprofit DP Center

PULLMAN, Wash. — Tight budgets and rampant inflation are everyday facts of life for most schools. And the impact is felt not only in the classroom, but also in each institution's data processing center, which has difficulties expanding, adding new equipment and licensing software to meet user demands.

One institution — Washington State University, based here — has found a way to avoid this financial dilemma. In fact, its local computer center is able to serve not only the academic and administrative computing needs of the university, but numerous federal, state and local agencies as well.

Considered to be one of the most powerful public information processing systems in the Pacific Northwest, the computing service center's user community consists of 75 different agencies and institutions tied together by several thousand miles of dedicated communications lines.

Key Factor

A key factor in the center's success is that it has operated as a nonprofit cost center within the university structure for the past nine years. For the previous 13 years, it operated as just another school department. It generated no revenue and required annual funding, Ted Krebs, the center's associate director, said.

"We wanted a computing facility we could grow with, one that would serve all our needs for the foreseeable future, but which had enough capacity to service nonuniversity clients and thus fund growth without depending on either the state or the university budget," Krebs said.

This approach to funding has made it possible for the computing service center to upgrade its Amdahl Corp. CPU-based computing facility a number of times over the past nine years — from an IBM 370/67, to a loosely coupled 360/67-65 combination, to an Amdahl Corp. system.

The university switched to Amdahl in 1977 by acquiring a 470V/6-II with 6M bytes of memory. This machine was replaced by a more powerful 470V/8 with 12M bytes of memory in 1980, which is the current system.

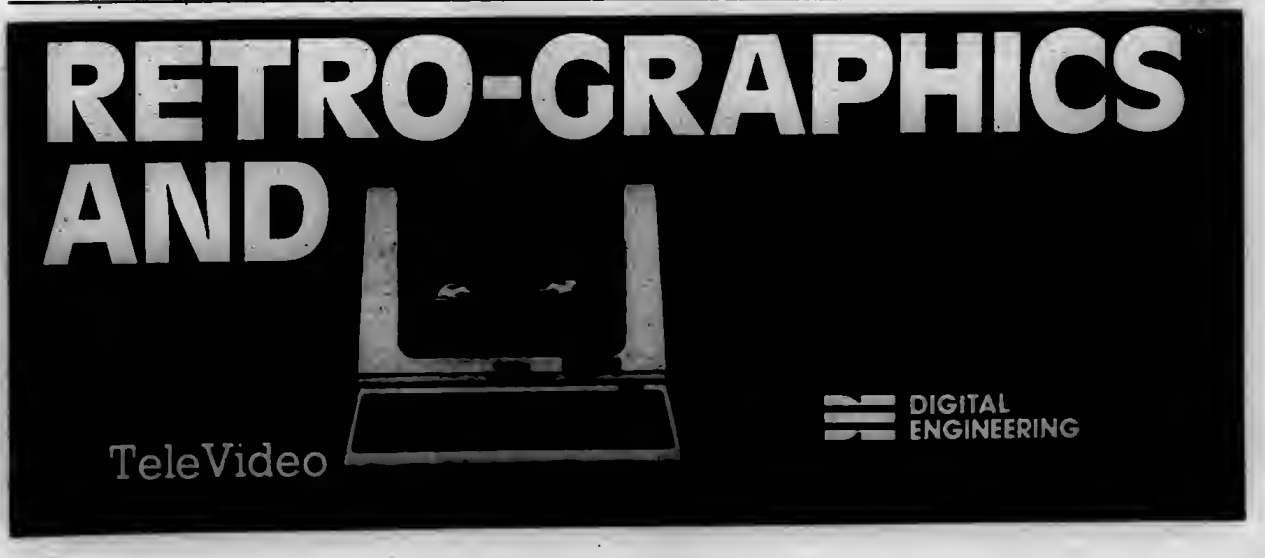
The system supports more than 17G bytes of disk memory and operates under VM/SP with CMS. It also offers MVS capabilities.

From offices around the campus and throughout the Pacific Northwest, users have access to the 470 via telephone and direct data lines, Krebs said. They interface with the computer using terminals suited to their own tasks. Output can be either transmitted back to the user site for printout or printed at the center.

Although a nonprofit entity, the center currently operates under the administrative control of the university.

The organization generates an average of $6 million in revenue each year, with about 55% of its income coming from nonuniversity organizations. All customers are charged on a cost recovery basis, Krebs said.

The center's operation "is not much different than the way motor pools or print shops on most university campuses function," he explained. "Using this financing approach, we avoid going through the normal budget-request processes and all the red tape this implies."



Remote Item Processing System Captures, Corrects, Communicates

NORRISTOWN, Pa. — A family of remote item processing systems designed to capture magnetic, optical character and optical mark data has been introduced by Scan-Data Corp.

Cheq+Plus, said to process up to 90,000 items/hour, contains hardware and software systems with multiprocessing capability to concurrently capture, correct and communicate data to a remote host computer via IBM 2780 and 3780 protocols.

Various configurations are available, offering from three to 40 pockets, microfilm and ink-jet printing. Software includes capture, proof of deposit, transit, on-line CRT reject correction and balancing.

With software, Cheq+Plus systems begin at $80,000.

Scan-Data is located at 800 E. Main St., Norristown, Pa. 19401.

Drafting Plotter Also Functions As Digitizer Through RS-232

DAYTON, Ohio — Skalar Systems has introduced a digital read-out drafting plotter that reportedly also functions as a digitizer to transmit X and Y coordinate information through an RS-232 interface.

The Skalar DDM 2001 Digital Drafting Machine may be linked to computers, terminals or computer-aided designed systems. A built-in microcomputer is said to provide scaling, relocatable origins, in./metric conversion and other features. It was designed to mount on a 43-in. by 72-in. drafting board.

The product is available for $4,000 from Skalar Systems, P.O. Box 339, Dayton, Ohio 45449.

Two Subsystems Designed For Bar Code Scanning

EUGENE, Ore. — Western Computer Systems, Inc. has introduced two bar code scanning subsystems targeted for those businesses that are using bar codes for inventory control or information tracking.

The Western 240 and Western 340 reportedly can be configured from one to 24 scanning stations using either hand-held wand or tabletop laser scanners.

Several types of bar codes can be read or printed on the systems, a vendor spokesman said.

The systems are reportedly based on a 16-bit microprocessor.

Several disk configurations are said to be available for data storage including 8.5M-, 32M- and 60M-byte Winchester disks or a 90M-byte disk cartridge drive.

Scanning application software is also available, as is a data base management system that allows flexibility in creating assorted programs to manage, organize and access the scanned information, a vendor spokesman said.

The Western 240 is available for $26,720; the Western 340 for $30,070, said the vendor spokesman.

Western Computer Systems is located at 1000 Bertelsen Road, Unit 1, Eugene, Ore. 97402.

HONEYWELL GCOS USERS

THERE ARE TWO OPINIONS ON INCREASING YOUR PROGRAMMERS' PRODUCTIVITY:

Programmers

"I think TOSC6 is a GREAT system — I use it almost every day. We're able to update files and correct data fields without taking the time to write a program. It's very handy when a user needs something in a hurry, like a listing that combines data from different systems. One of my favorite things is that I can use my standard COBOL data names when I want to, which makes it very easy to set up the procedures."

Barbara Mann,
MONTANA-DAKOTA UTILITIES CO.

"I find the succinctness of the language to be very useful. Four TOSC6 statements handled reorganizing my file. The alternative was a 300-400 line program. I often use TOSC6 simply to determine the characteristics of a file, for instance when I don't know the CISZ or record size."

Mark Boyer,
LOS ANGELES
COMMUNITY COLLEGE DISTRICT

Managers

"The simplest and best explanation of TOSC6 is that it's a productivity tool for the programmer. This has been proven to us . . . . The first week of January our Payroll Department was ready to have the W-2's produced, when it was found that some information was missing. To correct the files the old way would have taken an estimated five hours . . . With TOSC6, the W-2 file was corrected in 20 minutes!"

Lyle Hanson,
MONTANA-DAKOTA UTILITIES CO.

"I thought I would write to let you know of our satisfaction with the TOSC6 Software Product . . Please feel free to let others know of our excellent experience with TOSC6."

George D. Tobey, C.D.P., C.C.P.
LOS ANGELES
COMMUNITY COLLEGE DISTRICT

IT'S INTERESTING THAT THEY AGREE.

TOSC6

AN UNCONVENTIONAL UTILITY SYSTEM

CALL TODAY FOR A FREE TRIAL

TOSC International, Inc.
5433 Westheimer, Suite 1105
Houston, Texas 77056
(713) 961-1201

DOS/VS(E) and CICS/VS

- SYSTEMS PROGRAMMING CONSULTING Consultants in Minneapolis, Wash. DC, and San Francisco, each with 12+ years experience.
- PROGRAM PRODUCTS 30 day trial. Full documentation on request.

BIMSPOOL DOS/VS(E) Terminal Printer Spooler
Retrieves batch print from POWER/VS queue, converts and prints on 3270-type terminal printer via CICS or SHADOW. Jobs may also be viewed on CRT. May be used to eliminate RJE printers. $4000 or $200/mo

BIMSPOON On-line to Batch Print Spool
Used by DOS/VS(E) CICS/VS on-line application programs to create batch print reports under POWER/VS(E). Multiple tasks may create reports concurrently. If used with BIMSPOOL, reports may be spooled to 3270 terminal printers. $840 or $42/mo.

BIM-ODIS DOS/VSE CICS/VS Status Display
Summary, detail, and analytic displays of CICS/VS, DOS, VTAM and DL/I tables and control blocks. Used to determine CICS status and operational or performance problems. $2200 or $110/mo

BIMSERV DOS/VSE Library and VSAM Catalog Display
Displays directories and entries in all DOS/VSE libraries, VSAM Catalog, Label Area, and VTOC's (CICS). $1450 or $74/mo

BIMTEXT Word Processing System
Create formatted documents from free-form input. Margin justification, numerous other formatting options, permit document changes without retyping other text. $2400 or $120/mo

BIMDSLOG DOS/VS(E) Console Hard Copy File Display
Used by operators or programmers to review DOS/VS messages via CICS or SHADOW without tying up system console. $720 or $36/mo

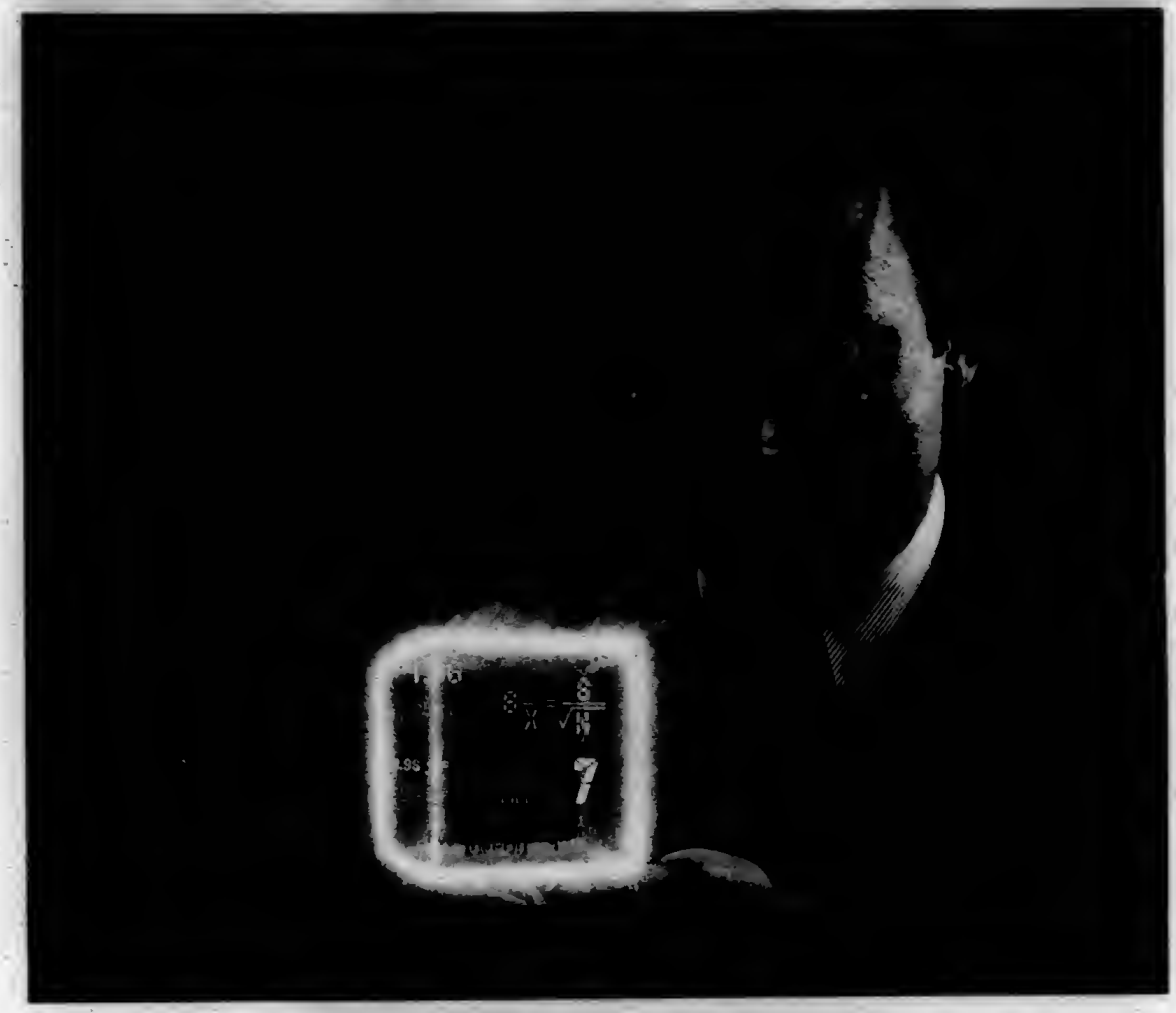
BIMMONTR DOS/VS(E) System Status and Queue Display
The original and still best DOS/VS(E) system activity, POWER/VS queue, and POWER/VS job output display system (CICS). Numerous options to assist operators and programmers. $920 or $46/mo

BIMDEVC DOS/VS(E) System Assignment Status
Displays logical unit assignments to devices (CICS). $360 or $18/mo.

BIMSUBMT DOS/VS(E) Job Submission Editing
On-line job stream editing, storage, and submission under CICS/VS. $1000 or $50/mo.

BIM B I MOYLE ASSOCIATES
4329 LYNDALE AVENUE SOUTH
MINNEAPOLIS, MN 55409
(612) 822-2661 Telex 290 123
Member Independent Computer Consultants Association

BRAINWARE™



Panaudit™: the software that gives you state-of-the-audit freedom.

Without the freedom to perform the auditing functions you want, your work is compromised. To assure that your work is always state-of-the-audit, we give you Panaudit. Created to offer the most freedom and efficiency of any EDP auditing system. Created by the Pansophic power of innovation that is Brainware.

Panaudit offers the most advanced auditing routines, and an expanded variety of statistical sampling routines, system ranking routines and integrity test routines.

Panaudit incorporates the latest ideas in EDP auditing efficiency. An automatic test data generator for proving routines. A source program validator that speeds verification. An English-language format. And a simple command system for storage, maintenance and retrieval of routines.

Future developments in EDP auditing automatically become part of Panaudit through continual enhancements.

Panaudit is more than software. It's a software solution. It's Brainware. And it's yours.

Panaudit is compatible with IBM, Univac, Siemens and FACOM.

For more information on Panaudit, Panvalet,* Panexec,* Easytrieve* and Panrisk,™ call (800) 323-7335.

PANSOPHIC

709 Enterprise Drive, Oak Brook, IL 60521

©Pansophic Systems, Inc., 1980

SUPPORT

We can help.

"Don't worry. I've got you."

Sure, it's possible to go it alone; to match wits and tools with any problem. Still, there's nothing like sound advice and able support to see you through a tight spot.

Which is why STC has built the largest independent field organization in the industry; more than 3000 people eager to help you plan, implement and maintain your system. People with the experience to smooth the route to your objectives.

Consider your present operating plan. You know where you are now. You know where you want to be by year end. In between are obstacles. Most are minor. Others will test the limits of your skills and resources: That daunting performance bottleneck. The looming capacity problem.

It is here that STC's Systems Engineers can help. They'll work with you to define and quantify the problem, then map out a solution. In some cases they may recommend specific hardware from STC's line of high-performance disk, tape, printer and system-level products. In other cases they may simply show you how to get more from your present gear.

Whatever your configuration, service from STC Field Engineers keeps your hardware in shape to fulfill its mission. With on going training, special diagnostic tools and on-site spares they're prepared to respond immediately to any problem.

Advanced hardware. Uncompromising support. With STC behind you, you can undertake the most ambitious goals with confidence.

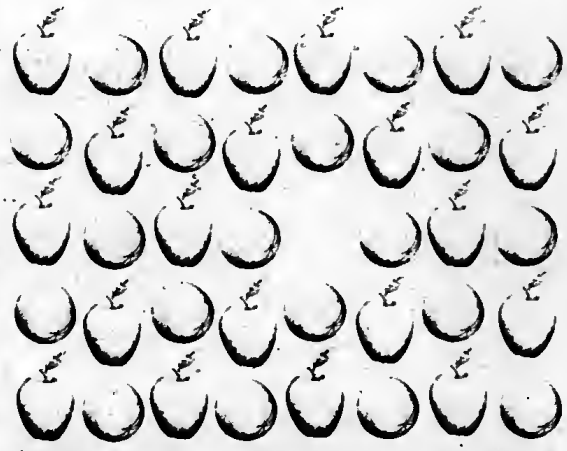
For details, contact your local STC Marketing Representative. Or write: Storage Technology Corporation, 2270 South 88th Street, Louisville, CO 80027. Phone: (303) 673-4063.

STORAGE TECHNOLOGY CORPORATION

Fulfilling the promise of technology

3 ISSUES IN HIRING PROGRAMMERS

1. Selection



2. Testing

3. Hiring Vs. Training

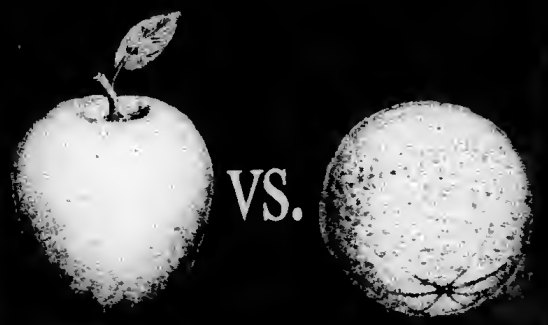
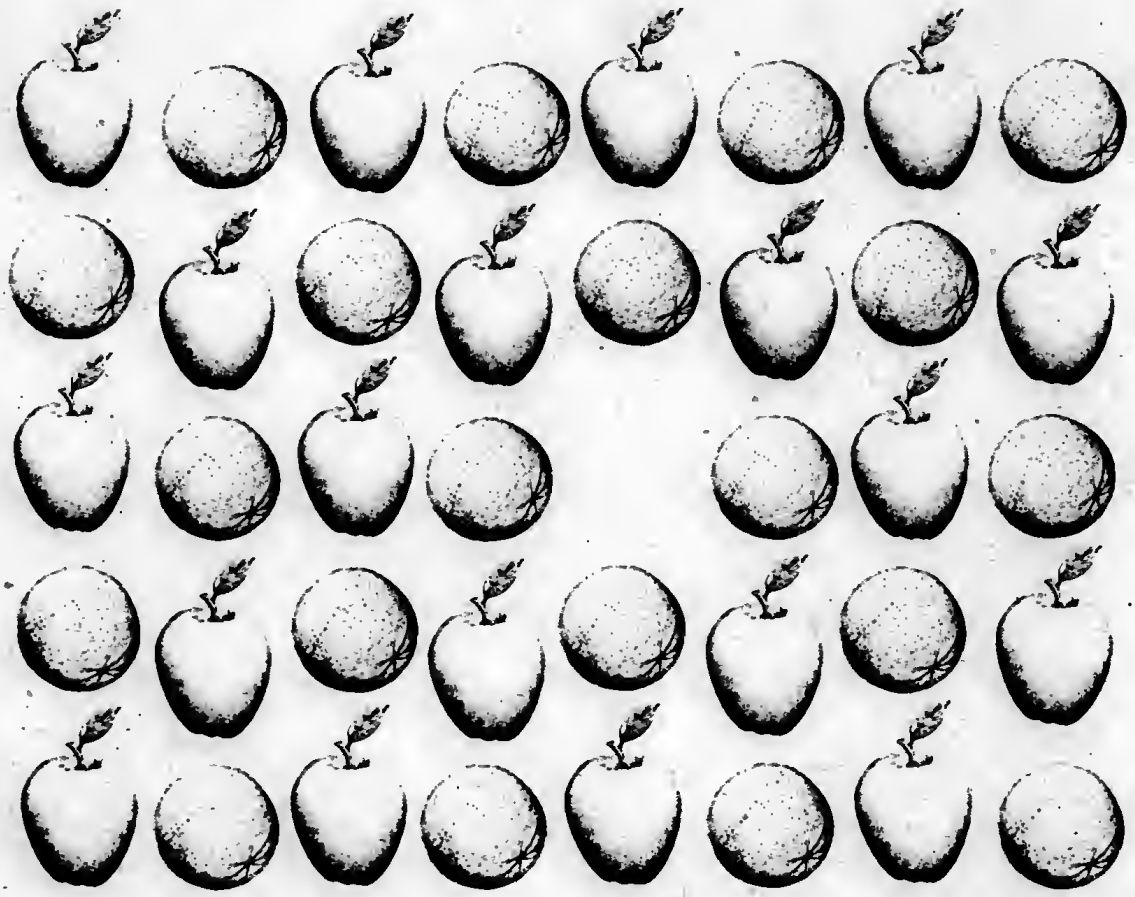


ILLUSTRATION BY GREG WENZEL

1. Selection



How to Pick Candidates For Entry-Level Programmer Training

By Bradley Nelson

More and more organizations are considering training their own programmers. This approach has many inherent advantages: it helps overcome the supply-demand problem for programmers and is less expensive than hiring from outside the company. Moreover, by offering attractive career opportunity programs, a company can lower its programmer turnover rate. But how should an organization go about selecting people to participate in an entry-level programmer training program?

This article will pose a number of questions that must be resolved before trainees can be picked and will provide some guidelines for answering them. There will be no attempt to describe the training itself. The questions to be addressed are:

- From which population will I select my applicants?
- What type of background should the applicants have?
- How do I know who will be successful?
- What are the Equal Employment Opportunity (EEO) considerations?
- Who should take part in developing selection procedures?

Many of the decisions concerning how to select applicants

Introducing the Only Terminal Good Enough to be a TRS-80®

- State-of-the-Art Design
- Emulates Four Popular Terminals
- 80 × 24 Video with Reverse And Half-Intensity
- Ten Baud Rates to 19.2K
- Two Printer Ports
- 12-Key Datapad

Radio Shack's New DT-1. The "No Compromise" Data Terminal.

Radio Shack's new TRS-80 DT-1 makes buying a video data terminal simple. You get the deluxe features you want for just $699. And it's as close as your nearby Radio Shack Computer Center (over 270 nationwide) or the expanded computer department of selected Radio Shack stores (over 470 nationwide) and participating dealers. It couldn't be easier to get a top-quality terminal!

Includes the Latest Technology. Unlike many terminals, the DT-1's configuration can be selected from the keyboard. The secret? A revolutionary non-volatile memory retains terminal configuration even with power off—and without battery backup!

Multiple Emulation Modes. Completely code compatible with four standard terminal protocols, the DT-1 can emulate a TeleVideo® 910, Lear Siegler ADM-5, ADDS 25 or Hazeltine 1410.

12" Diagonal CRT. Displays upper and lower case characters, as well as special single-character symbols representing control characters.

Special Features. The DT-1 has both RS-232C serial and parallel printer interfaces. A local monitor mode lets you enable printer ports and position the cursor using local control and escape modes. The carriage return key and the control key termination codes are user-programmable. Dual-speed repeating keys and an electronic bell are also standard.

Total Support. The TRS-80 DT-1 terminal is backed by Radio Shack, the number one name in microcomputers. We offer not one, but two service plans, training and a complete line of peripherals. Check out the DT-1 today!

Radio Shack®
COMPUTER CENTER
A DIVISION OF TANDY CORPORATION

I want to learn more about the DT-1. Please send me your free Radio Shack TRS-80 Computer Catalog today!

Mail To: Radio Shack, Dept. 83-A-32
300 One Tandy Center, Fort Worth, Texas 76102

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

Retail prices may vary at individual stores and dealers.
*TeleVideo is a registered trademark of TeleVideo Systems, Inc.

Everyone can

You don't need a big operation anymore to justify a VAX™ computer.

Because now Digital introduces the smallest in a growing line of VAX systems. The VAX-11/730.

It's just the right size for small departments. And just the right price.

For less than $60,000* you can have a VAX-11/730 packaged system, with 1 MB of 64K chip memory, 131 MB of disk storage (including Winchester drive), and capacity for 8 on-line users. All in a single cabinet just 42" tall. You also get a console printer. And, of course, the ability to increase memory, add disks, and bring on more users.

For an even smaller department you can choose a smaller version for less than $50,000*, with 20 MB of disk and a starting capacity of four users.

Either way, you get a computer that's every inch a VAX. With VMS™ Version III software. The availability of commercial and technical languages. VAX Information Architecture for distributed data access. Digital's office automation software for electronic mail, calendar keeping, and word processing. And third-party software written for the VAX family, from CAD/CAM to econometrics.

So whatever you're doing, you can do it with a VAX-11/730.

You'll be fully supported by Digital's customer service organization, available around the world.

Naturally, you can use Digital's DECnet™ networking software, and protocols like X.25 and SNA/SDLC for communications with other computer architectures. So your small departments can stay in close touch with the rest of your company.

use a little VAX.

Introducing the VAX-11/730.

And when small departments get bigger, they can move up to a larger VAX without rewriting their software. Because the VAX-11/730 is totally compatible with the rest of the VAX family.

You don't have to be big to have big computer power.

Now there's a VAX for everyone.

To learn more about the VAX-11/730, call our toll-free number: 800-DIGITAL, extension 200. Or send the coupon to:

Digital Equipment Corporation, 129 Parker Street, PK3-2/M94, Maynard, MA 01754.
Attn: Media Response Manager.
Digital Equipment Corporation International, 12 Av. des Morgines, CH-1213 Petit-Lancy/Geneva.
In Canada: Digital Equipment of Canada, Ltd.

*Prices apply in the U.S. only.

I'm interested in a little VAX.

Name_____

Title_____

Organization_____

Address_____

City_____ State_____ Zip_____

☐ Have a sales representative call me. ☐ Please send me literature.

CW-7-12-2

digital

IN DEPTH

will depend on where you look, either within or outside the company.

Methods for choosing candidates internally can range from singling out someone you know and feel would do well as a programmer to posting the opportunity throughout the company and letting anyone apply. Of course, there are many variations in between.

Applicants from outside the company may be recruited through selective advertising or by working through particular organizations, such as universities. But regardless of the option you choose, you must weigh the costs (complexity, dollars, EEO considerations) against the benefits (employee morale, application knowledge and so on) of each.

You may find it useful to consult with your employment or employee relations department or someone with EEO knowledge. This input will directly impact other selection procedure decisions.

When considering an applicant's background, the primary considerations are the "three Cs": computers, college and company. A true entry-level training program assumes the applicants have no prior knowledge, education, training or experience in computers.

Requirements for such educational background or experience have the effect of eliminating candidates with high potential. For this reason, you should not let prior exposure to data processing bias your selection, unless that exposure demonstrated a high level of performance.

While a college education is usually considered prerequisite, numerous studies have shown there is no correlation between education and success as a programmer. However, many people feel strongly that an undergraduate degree is very useful. They argue that college grads are a little more homogeneous and that a degree in an application-related area will help a person understand the application and develop his analytical abilities.

After many years of teaching entry-level programmers, I recommend the following: If you want to recruit applicants from a university placement office, go ahead; but don't make a college degree a minimum require-

Give your TeleVideo® terminal a new image.

If you have a TeleVideo® terminal, you're just minutes away from a high quality, versatile graphics system. At a very low price.

Our SG950 graphics enhancement gives you full Tektronix® 4010 emulation on TeleVideo® 950 terminals. 4010 emulation also is available for TeleVideo® 925 terminals with our SG925 graphics packages.

But chances are you'll prefer our built-in native mode graphics capability, a powerful tool that makes it easy to program graphics applications. Even if you're not a programmer.

You won't have to give up your regular TeleVideo® capabilities. And our separate graphics memory means you can switch from graphics to standard mode without losing data.

Our features have exceptional drawing power.

There are a lot of other reasons why our retro-fitted graphics are the best choice: Higher X-axis resolution than the competition. Larger addressable plot area, too—65K x 65K dots. Our switch selectable power-up modes allow you to choose the TeleVideo® mode, Tektronix® or native mode. Enhanced speed feature. Cross hair cursor and light pen options. And our easy-to-use software is compatible with many many operating systems.

High quality graphics on your LA120.

If you have an LA120 printer, our SG120R board can give it fast raster graphics capabilities. Our printer port option for TeleVideo® terminals is totally transparent to the system, so you can print alpha-numerics and graphics interchangeably. We can also interface with many other popular printers. Including DEC™ LA34 and C.Itoh 8510.

If you want to give your TeleVideo® terminal a new image, call Selanar. We're the experts in high quality, low-cost graphics.

SELANAR

We're giving terminals a new image.

Selanar Corporation, 457-A Aldo Avenue
Santa Clara, CA 95054 (408) 727-3011

TeleVideo is a registered trademark of TeleVideo, Inc. Tektronix is a registered trademark of Tektronix, Inc.
DEC™ LA 34 are registered trademarks of Digital Equipment Corporation.
Selanar Graphics and SG are trademarks of Selanar Corporation.

Evaluating The Interview

Crocker National Bank, whose interview form is shown on the facing page, evaluates candidates for its programmer training program in each of the following areas. Candidates are scored as "unsatisfactory, acceptable or very good" for each characteristic.

1. **Oral Communication:** Ability to express oneself clearly; ability to convey ideas, thoughts, information, etc.
2. **Flexibility:** Willingness and ability to adapt schedule, to respond to emergencies or urgent matters; agreeable to working nights, weekends, overtime.
3. **Scheduling:** Ability to plan and schedule activities; ability to organize projects, to work on more than one project simultaneously.
4. **Reaction to Pressure:** Ability to work under pressure, within time constraints and meet deadlines.
5. **Initiative:** Willingness to learn new things; to suggest and attempt new approaches.
6. **Work Style:** Desire to work through problems basically on own but to participate and share information with colleagues; able to work without close supervision; willingness to assume responsibility.
7. **Interest in and Commitment to Programming:** An awareness of profession and career; interested in self-development.
8. **Interpersonal Skills:** Ability to get along with others — co-workers, supervisors and clients; patience and understanding of others' role and function within system.
9. **Problem Identification and Solving:** Ability to identify problems, work through potential solutions, assess adequacy of solutions and implement correct solution.

Sample Interview Questions

The following interview questions are used at Crocker National Bank for its internal programmer training program.

I. Career:

1. Why are you applying for this position?
2. Why are you pursuing this kind of career?
3. Why do you want to leave your present job?
4. (a) What are your career aspirations?

(b) How long do you think it will take to reach these goals?

(c) What do you plan to do to help you reach them?

(d) Where does this job fit into your overall career plan?

(e) What makes you feel that this is the best career path for you?

(f) How will this job help you achieve your career goals?

5. What special aspects of your work experience have prepared or qualified you for this job?
6. What things about this program have caused you to hesitate to apply?
7. (a) How do you feel about your career at Crocker National Bank?

(b) What do you feel is the best thing that has happened to you at Crocker National Bank?

8. What might make you leave the job of programmer?
9. What kind of job or position do you see yourself holding two years from now?
10. If you hired a programmer, what characteristics would you look for? Which are the three factors you consider most important? Why?

How do you rate yourself on the three factors?

II. Motivation:

11. What do you think you will enjoy most about being a programmer?
12. What aspects about becoming a programmer give you the most concern?
13. What would you like to accomplish if you got this job?
14. Most people have strengths and weaknesses as workers. Tell us about your strong points. What are the areas needing improvement?
15. What are some of the things that motivate you to do a good job?
16. When you have been told about, or discovered for yourself, a problem in your work performance, what have you typically done? Can you give us an example?

III. Working Conditions:

17. How much overtime do you work? How do you feel about working overtime? Nights? Weekends? Holidays?
18. Programmers often must work strange hours under stressful conditions. How do you feel about this?
19. Who sets the pace in your present job? Do you face deadlines or work under pressure?
20. How do you react to disruptions in your regular work such as telephone calls, new assignments, urgent matters, etc.?
21. (a) Under how much pressure do you work best?

(b) Describe the most stressful situation in which you have been involved in your current job. How did you cope/react to the situation?

22. How much variety do you like on a job? How much responsibility would you like? What types of duties would you like to participate in?
23. What kinds of supervision have you received in previous jobs?

If you had to select the best qualities of the supervisors you had, what would they be? What characteristics would you consider least desirable?

24. What kinds of co-workers do you like best? Why?

IV. Experience:

25. Describe your present job. What are your duties and responsibilities? Have your duties and responsibilities increased as you gained experience on the job? If so, how?
26. (a) Can you describe for us one or two of the most important accomplishments in your career? Did you do this mostly on your own or was it a team effort?

(b) Do you prefer to work on a project alone or with two or three others? With a little or no supervision?

(c) Do you like to have a lot of projects going at one time or do you like to concentrate on one project until you complete it?

27. Can you tell us about something new you developed on a previous (or present) job, like a product or procedure that you are particularly proud of?
28. Describe the most important position or project that you have handled in terms of responsibility.
29. (a) I am sure that you were involved in some situation that just did not go right. Could you explain it? What caused the problem? What did you do to resolve it?

(b) What are some of the things you find difficult or frustrating in your present job? What have you done about this?

Software Exclusively For IBM System/38

Distripak/38™ software is the ideal ready-to-run order entry and inventory control system for distribution and manufacturing operations.

It is on-line, "*native-mode*," interactive software which eliminates conversion worries and delivers the 38's full potential.

Distripak/38™ gives you the full spectrum of key functions in one powerful, easy-to-use package: Order Processing, Inventory Control, Accounts Receivable, Purchasing/Receiving, Sales Analysis and Mail Order operations.

Call or write today. We'll respond immediately. The sooner you install Distripak/38™, the sooner your System/38 will deliver the goods.

Softmatics Corporation, 44 Mall Road, Burlington, MA 01803. Telephone (617) 273-3420.

Copyright © 1982 by Softmatics Corporation
Distripak/38™ is a native-mode conversion of the CA-PRISMS® System
CA-PRISMS® is a trademark of Computer Associates International, Inc

SOFTMATICS CORPORATION

High performance COBOL for PDP-11's

COBOL-PLUS

- *Automatic program segmentation runs mainframe programs on PDP-11's*
- *Self reorganizing multi-key ISAM*
- *Symbolic interative debugger*
- *Powerful screen handling*
- *Shared run time under TSX-PLUS*
- *Runs under RT-11, TSX and TSX-PLUS*

s&h computer systems, inc.

1027 17th Avenue South • Nashville, TN 37212
(615) 327-3670 • twx 810-371-1486

RT-11 and PDP-11 are registered trademarks of Digital Equipment Corporation

IN DEPTH

ment unless you are willing to pass up some top candidates.

There are a number of advantages to selecting applicants from within the company: Such candidates are already familiar with company goals and procedures, the industry and the application, and they will probably be more likely to stay.

This will only be true, however, if the applicants have been with the company for some length of time. Many companies establish a minimum employment requirement, commonly 12 to 18 months.

Who Will Succeed?

The success of an applicant as a programmer depends on a combination of aptitude and other factors. You must be careful, however, when evaluating these characteristics to make sure you stay within the guidelines of the Equal Employment Opportunity Commission (EEOC).

One way to evaluate aptitude is through a standardized test. EEOC guidelines recommend that each company validate an aptitude test for its population of applicants. (See the article beginning on In Depth/15 for further details on three programmer aptitude tests.)

A number of factors beside aptitude are normally identified as necessary for a programmer. These factors include oral communication, flexibility, scheduling, reaction to pressure, initiative, work style, interest in and commitment to programming, interpersonal skills and problem identification and solving. These factors can usually be evaluated by a structured interview.

Keep in mind that all interview questions must be job-related. One way to assure this is to do a job analysis of the entry-level position and ask questions that are directly related to the results of the job analysis. An example of an interview developed by San Francisco-based Crocker National Bank using such a process can be found on In Depth/7. This interview form is intended as an example, not as a universal form.

EEOC Considerations

With any type of training program, there are EEO considerations, especially when a particular process is used in selecting the participants. How concerned you are about EEO will determine how much effort and cost you will commit to protect your company against a possible lawsuit. Under ideal conditions, you should involve your internal EEO people from the beginning. You should also hire a validation expert who will:

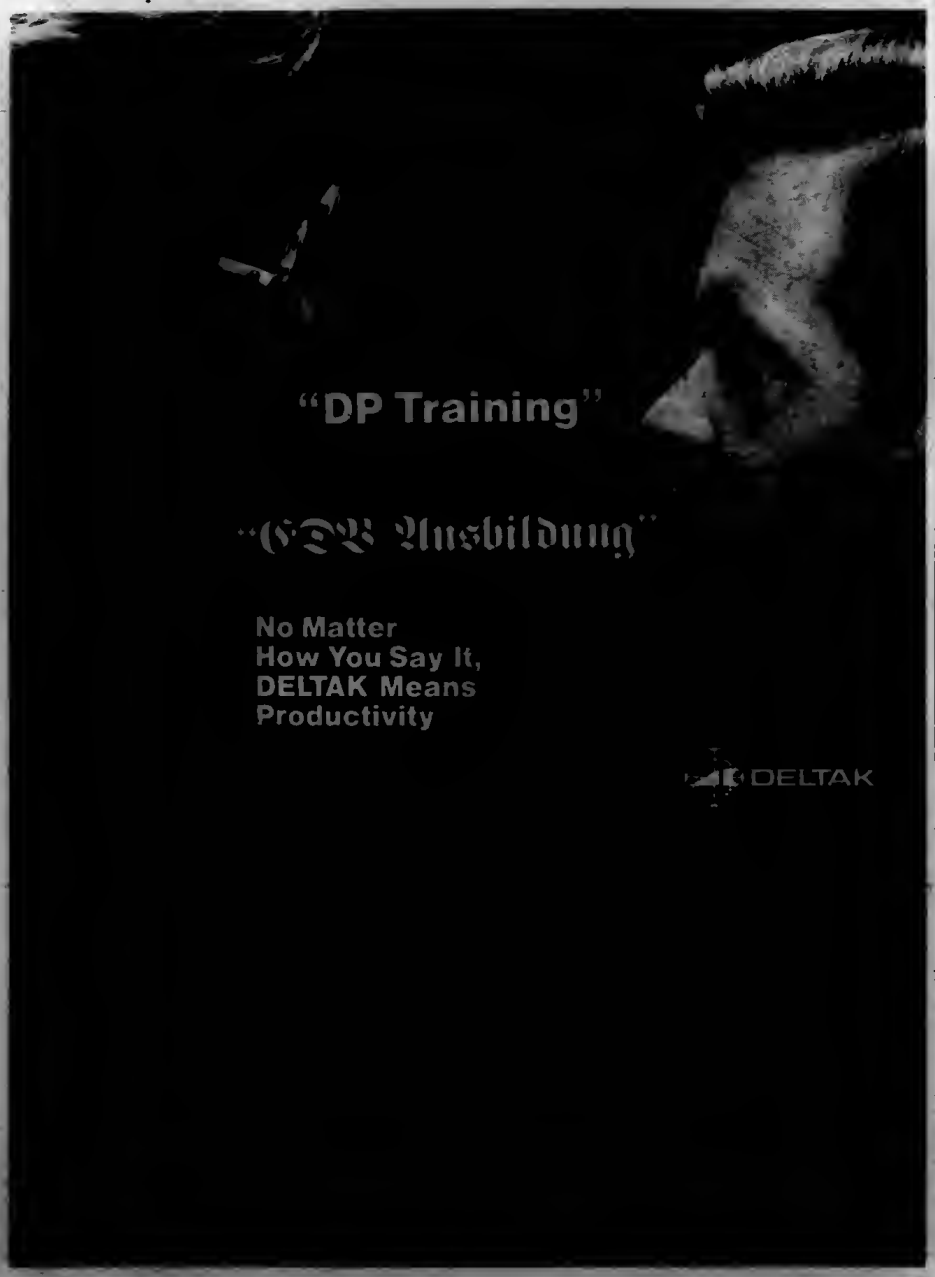
- Do a job analysis.
- Review the selection procedure to determine if it violates the results of the job analysis.
- Comment on or select the aptitude test (if one is given).
- Use the job analysis to design or to review the design of the interview.
- Do a statistical analysis to determine if there is a high statistical correlation among the selection procedure, success in the training program and success as a programmer. Ideally, lawyers will review the selection process and give their legal opinion or recommendation.

Parties Involved

Depending upon the complexity of the selection process you want to use, the following is a complete list of the people who might be involved:

- DP management.
- Employment management.
- Employee relations.
- Company EEO person.
- Company lawyers.
- Validation expert (internal or consultant).
- Aptitude test producer.

The complexity of your own selection process will depend upon how you answer each of the questions in the introduction to this article. Of course, there is no one best way to go about selecting applicants. The best approach is whatever works for you.



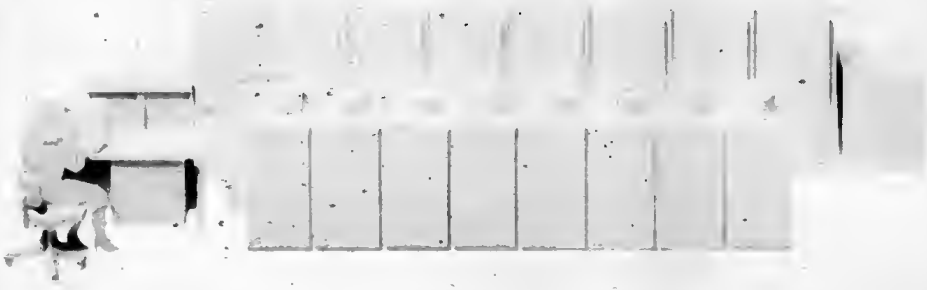
About the Author

Bradley W. Nelson is an independent consultant based in Renton, Wash. In the last four years, he has concentrated on the development of entry-level training programs for programmers.

Nelson received an M.S. in computer science from Washington State University and a Ph.D. in systems science at Portland State University.

When you need
enormous volumes of information,
from hundreds of sources,
in a variety of formats,
from anywhere in the world,
there are only a
handful of computer systems
that can do the job.

**When you
need it without fail,
there is only one.**



The Tandem NonStop™ Network

Components fail. But that doesn't necessarily have to mean downtime. With a NonStop network from Tandem, you're assured of completely reliable system operation—right through a component failure that would shut other systems down. The result is that you get the right information to the right people at the right time. Across the street or around the world. Without fail.

The network is based on the continuous processing capabilities of Tandem NonStop computer systems—a fault-tolerant environment in which a malfunction or component failure will not inhibit or interrupt system operation.

With a Tandem system, you can access information from anywhere in the network, in different formats (text, data and images), integrate all the information in a form that meets your specific requirements, and distribute the finished product at the appropriate times to any number of recipients at any number of locations. Those receiving the communication can 1) interactively add or delete information; 2) forward it to other individuals or send it back to the originator; 3) print it out; or 4) store it for future reference. Or any combination.

And in a Tandem network, all the advantages of NonStop system availability become NonStop network availability. If a line failure occurs, our advanced networking software transmits the message over the optimum alternative path—transparently to the user, of course.

But the result is always the same: your information gets through. Without fail.

DEVELOPING THE INFORMATION

As the nature of doing business on a large scale becomes ever more complex, so does the nature of the information behind it. Not only is this information in many different formats, it is typically widely dispersed throughout an organization. With most systems, that means throughput problems for those users in remote locations who need only occasional access to it.

Not so with Tandem.

The wonders of a distributed, relational database.

Unlike other approaches to distributed processing in which each location functions as an independent database, Tandem treats the network as one single database with multiple files distributed geographically. Programs will run with files from anywhere in the system, whether you have a single two-processor system or a 255-system network. And with no user intervention or special programming required.

The key is the relational organization of the database—an extremely flexible design concept that's also extremely easy to work with. Setting up files merely involves creating or filling in tables with pertinent data. So you save time and money right from the start on program development and maintenance. And to expand, you merely add new tables or add more rows to existing ones—without rewriting or modifying your applications programs. This lets you concentrate on the application at hand, not on system organization.

MOVING THE INFORMATION

Most business information systems are configured for the purpose of automating the tasks normally associated with office work: writing, printing, filing and distributing information within a local area.

THIS NETWORK WORKS

Tandem processors complement each other, working together to increase power, performance and throughput for a lower total cost per transaction. Adding NonStop fault-tolerant operation to advanced networking capabilities, the Tandem system virtually eliminates the risk of network failure. At the same time, it protects the database from damage caused by electronic malfunctions. And when a component does fail, the system can be serviced —parts removed and replaced— while continuing to process transactions. So your message is guaranteed to get through. On time, every time. And over the widest range of communications circuits, too: X.25 packet-switching networks, terrestrial circuits, fiber optics, even satellite links.

The ins and outs of transmitting data.

Tandem's comprehensive set of communications products protects your investment in other mainframe, mini, and peripheral products. The Tandem system supports BISYNC, ASYNC, SDLC and HDLC basic communications protocols. There are also a variety of software packages that allow a network of Tandem systems to be linked to other mainframes or networks (including SNA) for the support of interactive processing and remote batch processing.

In addition, the Tandem system can be interfaced to a wide range of terminal products such as text processors, ATMs, cash registers, badge readers, optical scanners and shop floor terminals.

Words and images.

Tandem's special facsimile software lets you store and forward facsimile reproduction of charts, graphs and diagrams to accompany text from various data files. And, you can access this information from any telephone with a facsimile machine. What's more, this ability to transmit graphic elements also greatly enhances our unique Query/Report Writer capability —the only such software on the market that optimizes both functions over a distributed database.

The speed of light.

Using state-of-the-art optical technology, our high-speed fiber optics extension provides the means to link Tandem processors up to a distance of 1000 meters between individual systems.

In effect, you can link up to 224 processors within your headquarters or plant, giving you an extremely fast and efficient system that provides enormous processing capability. And of course, you can interconnect this system into your network for expanded information-sharing capabilities.

The sky's the limit.

The lower costs and higher reliability of transmitting data over long distances via satellite is an economical and practical alternative for any corporation with geographically dispersed locations.

That's why Tandem has joined with American Satellite Company (ASC®) in a unique marketing agreement to provide the only completely fault-tolerant satellite communications network on the market today. So you can be assured of total NonStop system reliability, from operating system to orbiting satellite.

Following the NonStop system strategy, earth stations transmit and receive data over two parallel paths—if one is down, the other is still operational.

Also, ASC provides two different transponders on the satellite itself. Again, should one be inoperative, the second transponder and data path continue to function.

ASC provides the earth stations, including a special antenna that is small and light enough for mounting on a rooftop or in a parking lot. This can be directly connected to the computer system, without need of leased lines, for lower costs and

higher dependability. Tandem supplies all other ground components, including controllers, RF modems and complete computer/communication interface modules, all of which were designed with solid state technology for outstanding reliability. And, since Tandem maintains the entire system, you always have only one number to call for the answer to any question.

Putting it all together.

With a full range of communications capabilities and the enormous capacities of a global system, the Tandem NonStop™ network is uniquely suited to the complete information requirements of multi-divisional, multi-national corporations. And most especially for any business or institution that needs to get the right information to the right people at the right time. Without fail.

THE TANDEM EVOLUTION

A single system.

A single hardware architecture.

A single operating system.

A single database.

A single operating environment.

A single network architecture.

A single application environment.

The Tandem Evolution—our original design concept, still big enough to contain the past, handle the present and include the future.

The Tandem Evolution—an evolution in products and strategy that integrates information and communications in a single virtual NonStop system. A system with the flexibility to adapt as time, markets or economic considerations change. A reliable network that links people, equipment and data independent of location, application, form of data, method of transmission, number of users or types of equipment. An evolution that from beginning to end protects your investment in information resources.

The Tandem Evolution—a consistency in philosophy that's designed to give users the optimum in computer performance right now. While providing a continuing, flexible framework for enhanced performance tomorrow.

Tandem provides local sales and service support in the major computer markets throughout the free world. Plus fourteen software education centers in the U.S., Canada and Europe offering professional technical training courses for your programmers and analysts. With this kind of support behind each new capability, applications can be implemented on-line quickly, easily and economically.

If you'd like more information, call your local Tandem sales office listed on the back cover. Or contact Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014. Toll Free 800-538-3114 or (408) 725-6000 in California.

The system shown is a sixteen processor system. It can function independently or as the local node of a 255-system network, more than 4,000 processors, providing direct and immediate access to information sources anywhere in the world.

When you need it without fail, there is only one.

TANDEM

But communicating this information in a timely, reliable manner outside that area is another problem entirely. If you don't know beforehand precisely which locations are to be included in your network, you'll pay a stiff penalty in reprogramming and restructuring costs when you want to add nodes or change them around.

That's where the Tandem difference is so important.

Rings. Strings. Stars. Or any combination.

The Tandem system was designed from the start to be a single, flexible network. No matter what the configuration. Or how many times you change it. A simple two-processor system at one physical location may be thought of as a network, just as a 255-system configuration spread across the globe is a network. The very same network, at that. This concept of a *total* information/communications system results in significant time- and cost-saving benefits for the system designer. And ultimately, for the user.

Plenty of room to grow.

System expansion is easy and economical. Thanks to the network's modular construction, moving up to larger configurations is simply a matter of adding hardware, piece by piece, as requirements dictate. You start only with what you need, and add processors, peripherals and communications facilities in low-cost increments. And without having to rewrite a single line of software. That means your original investment in equipment and programs is always protected.

The right information to the right people at the right time.

The Tandem NonStop network integrates all devices into a single virtual system. This provides a framework for information handling that is independent of both content and

time. Each user can send, query, receive, store, secure, forward and distribute information at his or her own terminal. Including information from the database and images from a facsimile machine, and the user's own ad hoc memos. The system assures that the information will reach its destination at the user-specified time. And that's what effective communication is all about.

On a Tandem network terminal in the Dallas office, a sales representative accesses the corporate database to draft a quote document for presentation to a customer in London. Meanwhile, the San Francisco and Chicago offices respond to a separate "electronic memo" by sending charts on the customer's sales activity and copies of faxed news stories and photos. After product inventory figures from the Atlanta warehouse are added, the complete report is transmitted to corporate headquarters in New York, where the document is reviewed and a cover letter drafted. Finally, with a few simple keystrokes, the entire package is sent in seconds to the London sales office, with copies to New York and Dallas for storage on file. Thus, the full resources of the system are put to work for effective corporate information management.

For information on any of Tandem's computer products, contact the sales office nearest you.

DOMESTIC U.S. SALES OFFICES

Arizona
Phoenix (602) 264-2206

California
Long Beach (213) 595-9471
Los Angeles (213) 749-7356
San Diego (714) 571-7610
San Francisco (415) 777-1230
Santa Clara (408) 980-0440
Universal City (213) 506-1715

Colorado
Denver (303) 779-6766

Connecticut
Stamford (203) 324-5200

Florida
Orlando (305) 331-8088
Tampa (813) 877-7466

Georgia
Atlanta (404) 953-2377

Iowa
Des Moines (515) 223-1424

Illinois
Chicago (312) 856-1133
Itasca (312) 773-9414
Schaumburg (312) 397-5200

Indiana
Indianapolis (317) 875-8144

Kansas
Kansas City (913) 649-9002

Maryland
Baltimore (301) 859-4230

Massachusetts
Boston (617) 964-6500

Michigan
Ann Arbor (313) 662-2200
Detroit (313) 425-4110

Minnesota
Minneapolis (612) 854-5441

Missouri
St. Louis (314) 878-7180

Nebraska
Omaha (402) 493-6616

New Jersey
Atlantic City (609) 646-6928
Newark (201) 288-6050

New York
NYC Midtown (212) 760-8440
NYC Downtown (212) 558-6655
Rochester (716) 248-5300

North Carolina
Charlotte (704) 523-3170
Greensboro (919) 294-6131

Ohio
Cincinnati (513) 984-2044
Cleveland (216) 447-0880
Columbus (614) 764-2400

Oklahoma
Tulsa (918) 663-0940

Oregon
Portland (503) 682-0444

Pennsylvania
Philadelphia (215) 245-0600
Pittsburgh (412) 562-0262

Tennessee
Memphis (901) 332-3777

Texas
Dallas (214) 980-0051
Forth Worth (817) 640-9736
Houston (713) 861-6515
Irving (214) 258-0103

Utah
Salt Lake City (801) 268-6312

Virginia
Mclean (703) 734-5740
Richmond (804) 264-0012
Washington DC (703) 379-7900

Washington
Seattle (206) 881-8636

Wisconsin
Milwaukee (414) 476-2025

INTERNATIONAL SALES OFFICES

Canada
Calgary (403) 263-9064
Montreal (514) 342-6711
Ottawa (613) 234-0074
Toronto (416) 475-8222
Vancouver (604) 298-6461

Denmark
Taastrup 525-288

England
Birmingham 454-9772
High Wycombe 494-21277
London 628-0661
Northolt 841-7381

France
Paris 687-3466

Hong Kong
Kowloon 3-7218136

Italy
Milan 308-7386

Japan
Tokyo 81-3-984-6000

Mexico
Mexico City (905) 521-20230

Netherlands
The Hague 824-131

Singapore
Singapore 65-4690113

Sweden
Solna 734-0340

Switzerland
Zurich 663-025

West Germany
Dortmund 144401
Düsseldorf 313084
Frankfurt 5007
Hamburg 351721
Mannheim 510088
Munich 492011
Stuttgart 7156781

INTERNATIONAL DISTRIBUTORS

Argentina
Buenos Aires 393-1720

Australia
Melbourne 267-4133
Sydney 438-4566

Finland
Helsinki 358-42021

Greece-Mideast
Athens 30-1-743450

Korea
Seoul 34-6531

Kuwait
965-450265

Philippines
Manila 63-2-504076

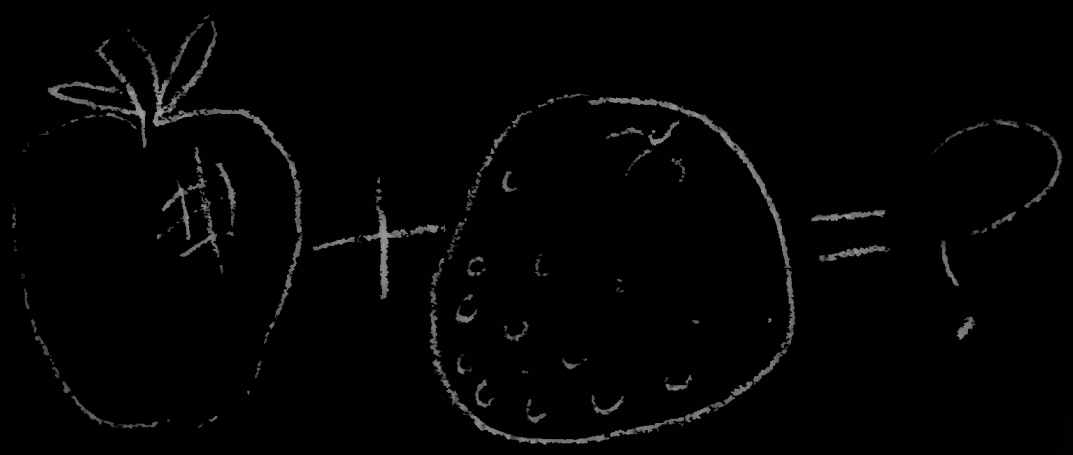
Saudi Arabia
966-3-8640272

Taiwan
Taipei 773-1302

Venezuela
Caracas 323150

TANDEM

2. Testing



Pros and Cons of Standardized Aptitude Tests For Programmers

By Howard Karten

For many DP managers and departments across the country, dealing with the shortage of qualified programmers and analysts means developing a supply in-house, via company training programs. But belt tightening, budget cuts and productivity concerns mean training departments are becoming more selective, attempting to admit only the most promising candidates.

In their efforts to select top candidates, managers are making heavy use of programmer aptitude tests. Despite the complexities associated with testing, many training directors are using programmer aptitude tests in a sophisticated way. As a result, most users are happy with them, despite some of the legal pitfalls and complaints that periodically crop up.

Although the tests may be effective, some questions remain unanswered. Some of the legal aspects may not have been fully resolved. Moreover, there may be hidden dangers in testing as a selection method, and overreliance on testing is a constant temptation.

The first programmer aptitude tests in widespread use appeared in the late '50s or early '60s. Among the earliest was a test

IN DEPTH

IBM distributed to its customers. Withdrawn from distribution by IBM several years ago, that test has now been succeeded by three others that account for the bulk of testing today: the Berger Aptitude for Programming Test (BAPT), distributed by Psychometrics, Inc.; the tests distributed by Wolfe Computer Aptitude Testing Ltd.; and the Computer Programmer Aptitude Battery distributed by the IBM subsidiary Science Research Associates, Inc. (SRA).

Despite the fact that IBM has dissociated itself from the test bearing its name, that instrument remains in wide use around the country, principally at smaller installations and computer schools. An IBM spokesman was unable to provide any information about the reasons for discontinuing distribution of the test; IBM uses another test for selecting its own programmers.

For the most part, vendors and test users are satisfied that high scores on any of the three tests correlate well with good on-the-job performance following training. "An informal study we did found a very strong correlation between good, mediocre and poor performers in a testing and job performance situation," said Psychometrics, Inc. codirector Dr. Frances Berger. "People who performed well on the Wolfe test also did well at job performance, although that test [may incorrectly] weed out some good people, too."

With a large number of applicants for programmer trainee positions, incorrectly eliminating qualified applicants is no problem since there is an ample reserve.

Test users, too, report that people who score high perform well later. But this confidence may not be entirely well placed. Although most validity studies report high correlations, the passage of time and other changes may require continuing studies. "The government in general has not been too kind to people who don't do [validity] studies within their own organizations," according to Dr. Mary Tenopyr, manager of employment research for AT&T and a sometime paid government adviser in Equal Employment Opportunity (EEO) testing.

According to psychologist Dr. Victor Howard of the Chicago-based management consulting firm Rohrer, Hibler & Replogle, Inc., "Some managers may overrely on test scores and numbers. Personally, I think managers may be putting too much blind faith on test scores as qualitative and/or quantitative numbers. We advise clients to use common sense in selecting people and to look [as well] at compatibility of employees." Howard's consulting includes advising clients on employee selection.

Validity Study

One ambitious study of test validity was performed several years ago by AT&T and Psychometrics. In that effort, some 350 applicants for programmer jobs were tested and hired without regard to their scores. Job performance was later correlated with scores on the test. The study revealed correlations between .61 and .71 for performance on the job and on the Berger test. "Statistically, that correlation is highly significant [that is, it could not have occurred by chance]. It was more highly correlated than other test instruments used," Berger recalled.

Not all studies are as rigorous or have samples as large. Sandy King, automated systems development training manager at Shawmut Bank of Boston, noted that her training program had tested 200 applicants with the Wolfe tests, selecting 14 who eventually completed the program. "All 14 have received above average or very good ratings in each performance appraisal, and all are still with the company," she noted.

Obviously, the larger the sample size, the more conclusive the results. This leaves smaller employers in a somewhat tenuous position in terms of having the resources (test takers, money) to conduct their own validity studies.

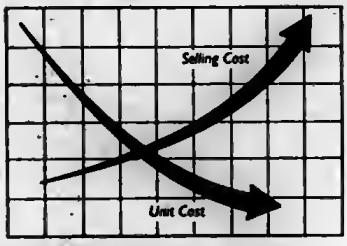
Concern over validity studies leads all three test makers to stress this aspect of test construction and purchase. In the sales literature they send out, Psychometrics, SRA and Wolfe cite several validity studies they have done and the results.

In some cases — whether for rea-

HALT...RESET

MARKETING PRODUCTIVITY IS THREATENED.

As your products decline in price... and your cost to sell rises. As your products become more sophisticated... and your prospects increase... You need *"real-time interaction, with real-time buyers."* You need a permanent market place.



MEETING THE MARKETING CHALLENGE.

Helping you meet this challenge — The Dallas Market Center – with over thirty years experience in bringing buyers and sellers together – provides you a new facility — The INFOMART.

The INFOMART... *The International Information Processing Market Center*... is a medium

designed to meet today's marketing challenges. We envelope the economies of scale to help you improve productivity and maintain organizational profits. We will host and sponsor frequent on-site trade shows and seminars. We will execute concentrated media campaigns promoting The INFOMART with our full-time staff of public relations and advertising specialists.

Plan today to explore this new marketing technique to reach, educate and service your prospects and customers... For your detailed plans on our concept and what we can do for you contact:

Bill Winsor
INFOMART
Dallas Market Center
2100 Stemmons Freeway
Dallas, Texas 75207
214-655-6235

INFOMART
DALLAS MARKET CENTER

sons of professional ethics, marketing or other considerations — some details are sketchy. Psychometrics, for example, cites studies done at Standard Oil of Indiana and Continental Assurance Co., as well as studies at a financial institution and manufacturing firm (neither of which is identified). Wolfe also cites some specific companies and leaves some unnamed.

SRA sends out some reports of validity studies to prospective clients, but does not name them.

None of these three vendors has published validity studies in recognized psychology journals, where the studies would be subject to the scrutiny and criticism of other professional psychologists involved in test construction.

The whole area of programmer aptitude test construction, in fact, has received relatively little attention by academic psychologists or researchers. "I don't know of any of my peers or colleagues or other academics who are spending time on research in this area — and I don't know why, either," notes University of Colorado psychology professor J. Daniel Couger.

No Good Criticism

Although books and critics of standardized testing turn up with near-monotonous regularity, detailed criticisms of the programmer aptitude tests are not to be had. A search of academic psychology journals turned up no such studies; the only critical one came from a recent issue of *Communications of the ACM*. University of Cincinnati computer science professor Larry Mazlack found no significant correlation between scores on the IBM Programmer Aptitude Test and grades of students enrolled in computer science courses. Mazlack concluded that standardized programming tests were not predictive of success in learning programming, at least for college students taking the IBM test.

In a telephone interview, Mazlack noted that he was satisfied his results were valid and "probably" (but not conclusively) applicable to larger populations. "I [doubt] the tests end up testing whatever it is that makes a good programmer," Mazlack said of tests in general.

We were unable to learn of any test users who have dropped their tests or switched to a different instrument. Most of those with whom we spoke echoed Bob Bargerhuff, education coordinator for the State of Indiana's Computer Division. "Our results [with the Wolfe test] are superior to anything else we've used. We've used the Wolfe test for 10 years, and we're very happy with it."

Bargerhuff also pointed to the importance of motivation as a factor in subsequent job performance: Indiana has admitted to its training program some applicants with low test scores who were "high on loyalty and motivation," and they later excelled at their jobs. "This test eliminates a lot of good people — low scorers who probably would make good programmers. It doesn't affect us adversely, however," he said.

'The general rule is that under equal opportunity legislation, you shouldn't give tests unless they measure something relevant to the job.'

Understandably, many of those closely involved with programmer trainee selection using aptitude tests are cautious about speaking for publication. Some fear involving their company in lawsuits and EEO actions. These managers look closely at test relevance and supporting data, particularly since a well-publicized 1971 Supreme Court decision, which held that selection tests must be relevant to the job to be performed.

"Users generally don't take the trouble to talk with legal departments of their firms," noted Shawmut Bank's King. "We did, as part of the test selection process. Wolfe has been very cooperative and very willing to supply materials relative to its validation studies." The sizable package of materials Wolfe sends out includes material detailing the test construction process and the legal ramifications of testing. Wolfe stands out in this respect.

All three test distributors emphasize the research backing up their tests. Psychometrics cooperated with AT&T and the operating companies on an ambitious validity study some years ago. SRA also has done studies, but releases few details. And Wolfe, which estimates that it has roughly 1,000 clients, has validation data available in the event of a suit involving its clients or test.

Although test users are cautious in selecting tests and in talking about them, the worst fears they harbor may not be justified. "I have not seen any cases in court regarding programmer aptitude testing; I am aware of none," notes Woburn, Mass., attorney Robert Bigelow, who specializes in the legal aspects of data processing. "The general rule is that under equal opportunity legislation, you shouldn't give tests unless they measure something relevant to the job. I would sure as hell want to see some data on validity [before selecting a test]," Bigelow added.

Some users also have questions about the possible dangers of selecting applicants who score too high on tests. Most employment managers

Test Vendors & Prices

Three vendors account for the bulk of the activity in programmer aptitude testing. The following price information was valid as of July 1.

Science Research Associates, Inc., 155 N. Wacker Drive, Chicago, Ill. 60606, (312) 984-7000. SRA, an IBM subsidiary, sells the Computer Programmer Aptitude Battery. A package of five reusable test booklets costs $38; a package of 25 answer sheets costs $18.40; the examiner's manual, $4. Users score these tests themselves.

Psychometrics, Inc., 2800 Olympic Blvd., Santa Monica, Calif. 90404, (213) 829-0248. Psychometrics sells two tests: the Berger Test of Programming Proficiency for experienced programmers and the Berger Aptitude for Programming Test. The former costs $20 per test including scoring; the latter costs $25 each for the first 100 copies purchased by one customer, with the next 50 at $20 each. Psychometrics will also administer the aptitude test at its headquarters for $25. It takes 90 minutes, and a written report of scores is mailed to clients.

Wolfe Computer Aptitude Testing Ltd. Wolfe may be reached through Box 319, Oradell, N.J. 07649, (201) 265-5393 (or Box 1104, St. Laurent Station, Montreal, Quebec, H4L 4W6, Canada). Wolfe sells several tests, including the Wolfe-Spence Programming Aptitude Test and the Wolfe Programming Aptitude Test, both of which cost $35 each. The Aptitude Assessment Battery: Programming costs $80.

The company also sells other tests for operators, systems analysts and systems programmers. Discounts are available for quantity orders of $1,200 or more.

Some tests are available in languages other than English. Scoring on some tests also includes written evaluation of test applicants based on analyses of the completed tests.

NEW COURSE

CICS COMMAND LEVEL PROGRAMMING

New York August 9 - 11
New Jersey September 20 - 24
New Jersey October 18 (evenings)

Quality training has been our commitment for over a decade.

We are proud to continue this tradition with our new course CICS COMMAND LEVEL PROGRAMMING. Features and facilities available through CICS Release 1.5 are covered.

The workshop portions of the course provide immediate and practical reinforcement of the lecture materials. Applications programmers can start to code in CICS immediately.

Call now for your free topic outline on this or any other course offered by Chubb Institute.

ADVANCED TRAINING CENTER
A Division of Chubb Institute
480 Morris Avenue, Summit, NJ 07901
(201) 467-7680

OFFICE AUTOMATION IS HERE. SO IS OUR NEW FASTRAK™ TERMINAL.

A Series 5000 is the only computer system you need to automate all your office functions. Coupled with our new FASTRAK workstation, Series 5000 supports just about every office automation function you can think of. From text editing to touch screen, Series 5000 has it all.

Series 5000 is faster and much more powerful than any computer Four-Phase has ever built. Yet it is compatible with existing Four-Phase software, including Corporate Office Management System, our new office automation package. COMS/IV incorporates electronic mail, office functions, data processing, and communications into a single integrated system.

The FASTRAK terminal is a true multifunction workstation. For instance, your secretary can switch from word processing to conference scheduling with one keystroke. At the same time, you can record and send a spoken message, examine and revise a graph in a report, or even instantly turn your terminal into a powerful personal computer that supports the CP/M® operating system.

The Series 5000 and FASTRAK workstation are available in several models. For maximum cost-effectiveness, you can tailor different systems within the same network to match specific needs. And if you have already begun piecing an office automation system together, you will be glad to know that Series 5000 systems can interface with peripherals from many office equipment vendors.

Your Four-Phase equipment is supported by one of the most extensive service networks in the industry. More than 1000 field engineering personnel in over 150 locations across the continent provide a level of expertise unique in the industry.

Series 5000 processor features include:

- support for up to 128 FASTRAK workstations with printers
- communications support for ASYNC, BISYNC, SNA, SDLC, X.25
- broadband local area networking
- up to 16 loadable character sets
- up to 6 M bytes RAM
- integrated service processor
- high speed Direct Memory Access architecture

FASTRAK features include:

- touch-sensitive display
- voice store and forward
- high resolution graphics
- personal computer option
- display segmentation
- ergonomic design
- detached keyboard
- multiple display formats

Four-Phase Systems. The

MOTOROLA INC.
Information Systems Group

SO IS OUR NEW SERIES 5000.
SO WE'RE READY WHEN YOU'RE READY.

At Four-Phase, we were doing office automation before it was called office automation. So we're ready when you're ready. Call us at 1-800-528-6050 extension 1599 (in Arizona call 1-800-352-0458 extension 1599). Or write Four-Phase Systems, 10700 N. De Anza Blvd., Cupertino, California 95014, m/s 52-10A7.

CP/M is a registered trademark of Digital Research, Inc. Corporate Office Management System, COMS/IV and FASTRAK are trademarks of Four-Phase Systems, Inc.

Office Automation Company.™

IN DEPTH

are wary of hiring over-qualified people who may become bored. The primitive facilities of early computers made intense intellectual demands of programmers, leading early DP managers to hire only "the best and the brightest." In many quarters, that desire for the cream of the crop continues and may be mistaken.

One DP manager at a New York City insurance firm reported that his company is leery of hiring applicants with too good a college or performance record. "We have a feeling — based on limited experience — that we'll spend thousands to train them, and six months or a year later, they'll take off for more excitement," he said.

King also recalled that one of her former employers used the IBM test and noticed that "people with a high score are more inclined to build a better mousetrap, and they became dissatisfied sooner." In her selection efforts, King now concentrates on getting a "well-rounded individual" who is oriented toward getting the job done, rather than "seeking esoteric ways of doing things."

The data on this question remains more anecdotal than conclusive. Many employers still try to get the smartest candidates they can. "I've heard that story [about over-bright applicants] for the last 25 years, but I have never seen one shred of scientific evidence to support it," AT&T's Tenopyr remarked.

Another lurking danger is using the test as the sole criterion for selecting applicants. "We advise clients to use common sense in selecting people," Howard said. "There definitely is a place for testing, but it's a controlled place. We advise clients to use common sense in selecting people and to look at the compatibility of a person with what's needed on a job."

Others had similar advice, such as this from employment manager Robert Smith of New England Telephone Co.: "Computer jobs are not just seven-and-a-half hours of banging on a computer terminal. Our systems people have to communicate with others, so interpersonal skills are important. We also look for extracurricular and civic activities."

Test distributors regard the future of their industry as bright and growing. "Business is increasing fairly dramatically, especially since the Republican victory, and there is more of an emphasis on efficiency, rather than just on equality," said Steve Berke, vice-president for sales at Wolfe in Montreal. Berger of Psychometrics is also confident of the future of testing. "Business is increasing because employers are training their own personnel due to the tight market," she noted.

Other observers are not so sure, however. Couger predicts a decline in the future of testing, driven by EEO-related fears and increasing skepticism regarding test validity. "I know of one large firm that says it can find no correlation between test performance and the performance of their people," he noted. Howard adds, "I concur with Couger. You can have a pretty hard time providing a relationship between testing and success on the job [in the event of a suit]."

In general, however, the future of programmer aptitude testing appears to be stable, and perhaps even rosy. Most users are satisfied with the tests they are currently using. Morever, the costs are modest enough, particularly when weighed against the possibility of admitting an unqualified candidate. Moreover, no critic has yet appeared to level serious charges against any particular test.

Although some research organizations are reportedly developing aptitude tests for internal use by computer vendors, we were unable to learn of any current efforts aimed at developing new tests for use by computer users. Certainly the costs involved, as well as the potential for legal challenges, would appear to be one factor dampening the enthusiasm of any such would-be test distributor.

About the Author

Howard Karten is a Boston-based freelance writer who specializes in data processing and behavioral issues.

Karten has been involved in data processing for more than 15 years and has done graduate-level work in psychology.

TSO USERS
HAVE AN INTELLIGENT
CONVERSATION WITH YOUR 3270!

ARE YOU DEVELOPING ONLINE TRANSACTIONS FOR IMS OR CICS?

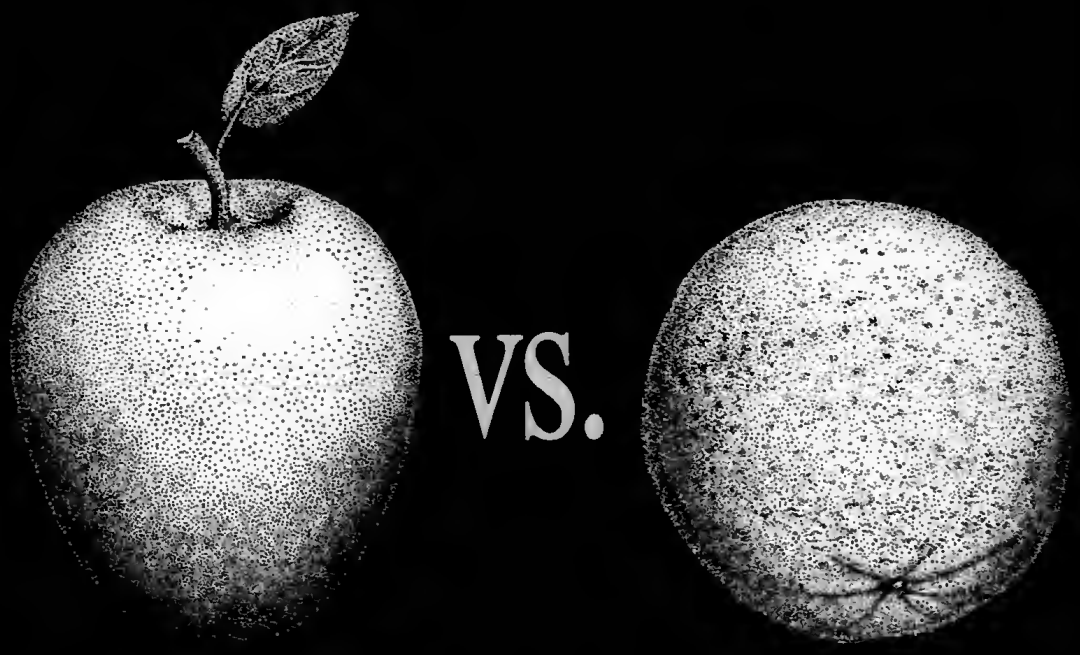
before

DO YOUR USERS WANT INTERACTIVE FUNCTIONS?

Screen-AID

INTERESTED?

3. Hiring Vs. Training



Experienced Programmers Or Trainees? A Productive Time/Cost Model

By Bradley Nelson
And James Lowrey

As companies consider training their own entry-level programmers, managers face the problem of trying to justify training from a productivity/cost point of view.

We will present a model that can be used to determine the productive times and costs of hiring vs. training programmers. The model considers two basic types of costs: the actual cost of hiring or training a programmer (acquisition costs) and the more intangible costs that are associated with the productivity of the acquired programmer (productivity costs).

The latter costs are developed by first calculating the productive times of hired experienced programmers and of trained entry-level programmers. This is done by subtracting the time spent in various learning curves from the total time the person is available for productive work. These times are then converted into costs. By looking at the differences in the productive times and costs, it is possible to get some valuable insights into the question of whether to hire or train programmers.

There are four major acquisition costs of hiring a computer programmer: cost of announcing the position, interview costs,

IN DEPTH

Acquisition Costs For Hiring a Programmer

Position announcement
- Set up cost for special recruitment program (internally and/or through employment agency).
- Newspaper advertising.
- Periodical advertising.
- Other promotion.

Interview costs
- Interviewee (if he/she is paid to come to be interviewed).
  - Transportation.
  - Hotel accommodations.
  - Expenses (per diem).
- Interviewer (if interviewer travels to do interviews).
  - Transportation.
  - Hotel accommodations.
  - Expenses.
  - Facilities to do interviews.
  - Receptionist (if necessary).
- Interviewer's time (based on salary).
  - Personnel.
  - Computer systems department managers.

Hiring costs
- Agency fees.
- Correspondence (and telephone conversations) extending offer, bargaining, confirming terms (date, salary, benefits, responsibilities).
- Administrative costs associated with a new hire coming on-line (for example, establishing personnel records).

Relocation costs
- House-hunting trip(s).
- Closing costs assistance.
- Moving.
- Travel.
- Lodging.
- Lodging while looking for permanent residence.
- Expenses (per diem).
- Other.

Figure 1

hiring costs and relocation costs. Figure 1 describes these costs in finer detail. Departmental records and personnel should be able to provide most of the information (estimates) necessary to quantify these costs.

The first two costs, for position announcements and interviews, should be averaged over all people interviewed. The last two costs, hiring and relocation costs, should be averaged over all programmers hired. This could be an overall company figure; however, overall company figures may understate the average for programmers. The sum of the four average costs will give you the average hard cost of hiring someone.

Acquisition Costs For Training a Programmer

Selection
- Development of selection procedure.
- Implementation of selection procedure (for example, posting in company's job opportunity program).
- Prescreening applicants.
- Aptitude test (if used).
- Selection of applicants to be interviewed.
- Interview costs.
  - Facilities.
  - Interviewer's time (based on salary).
  - Interviewee's time (based on salary).
- Final selection of applicant and notification.
- Validation study (if desired).

Training
- Vendor cost.
- Student salaries and benefits.

Placement
- Orientation for managers being assigned graduates (if desired).
- Administrative costs (for example, changing personnel records to reflect new assignment).

Figure 2

The major acquisition costs associated with training computer programmers are selection, training and placement, as shown in Figure 2. Depending upon how many programmers you wish to train and how involved the selection process needs to be, the costs associated with selecting applicants can range from next to nothing to a significant amount. (As a preliminary to establishing costs for selection, see "How to Pick Candidates for Entry-Level Programmer Training," which begins on In Depth/1.)

In deriving the selection costs, the average cost of developing the selection procedure should be used, that is, the cost of development of the selection procedure divided by the number of times the selection procedure will be used. The cost of training should be available from various vendors who provide entry-level programmer training. You should be able to estimate the other costs with the help of the personnel department. The sum of the selection, training and placement costs divided by the number of students you wish to train will give you the average acquisition cost of training entry-level programmers.

As stated before, productivity costs are difficult to measure and are not normally considered in determining the out-of-the-pocket costs of acquiring a programmer. Some of these costs are often overlooked when users consider the hiring vs. training question, and others are given a disproportionate weight.

The Case for Hiring

A common argument for hiring rather than training is that an experienced programmer is far more productive than an entry-level programmer. While there is a learning curve associated with data processing, one must be careful to consider several other learning curves: company, industry in general and applications.

One banker recently made the following comment to a group of people selected from within the bank to be trained as computer programmers: "Keep in mind, most of the experienced programmers we hire speak computers but don't speak banking, banking applications or [bank's name]. You, on the other hand, speak banking, [bank's name] and at least one banking application; and we are going to teach you how to speak computers."

An attempt should be made to quantify the learning curves in each of these four areas. You may want to acquire the subjective evaluations of a number of experienced programmers and managers.

Assume the entry-level programmers have an average of two to three years' experience with the company. These figures should be expressed as the average amount of time spent learning. These estimates can be used to develop a composite amount of time spent learning — the LCEP and LCELP described in Figure 3. The difference between these two estimates, however, does not truly reflect the difference of the productive time spent by these people. One must also consider their length of employment.

Reducing Turnover

Selecting applicants from within the company should help reduce the turnover rate. One effective measure is a 12- to 18-month residency requirement for the training program. Most people who are job hoppers or are dissatisfied with their jobs will have left the company before that time has elapsed. The residency requirement will help ensure that participants have a vested interest in their employer.

Composite Learning Curve for Experienced Programmers
LCEP = DPLCEP + CLCEP + ILCEP + ALCEP

Composite Learning Curve for Entry-Level Programmers
LCELP = DPLCELP + CLCELP + ILCELP + ALCELP

Learning Curve Difference
LCD = LCELP - LCEP

Productive Time Difference
PTD = (LSELP-LCELP) - (LSEP-LCEP)

Cost of Productive Time Difference
PTD$ = AELP$(LSELP-LCELP) - AEP$(LSEP-LCEP)

Total Cost for Productive Time Difference
PTDT$ = (AELP$(LSELP-LCELP) + hard cost for training)
- (AEP$(LSEP-LCEP) + hard cost for hiring)

Where:

DPLCEP = data processing learning curve for experienced programmers
DPLCELP = data processing learning curve for entry-level programmers
CLCEP = company learning curve for experienced programmers
CLCELP = company learning curve for entry-level programmers
ILCEP = industry learning curve for experienced programmers
ILCELP = industry learning curve for entry-level programmers
ALCEP = application learning curve for experienced programmers
ALCELP = application learning curve for entry-level programmers
LSEP = length of service of experienced programmer
LSELP = length of service of entry-level programmer
AEP$ = average experienced programmer salary (including benefits)
AELP$ = average entry-level programmer salary (including benefits)

Figure 3. Productivity Costs of Hiring/Training a Programmer

IBM 3274 Users.
Now, A Lot Less For You.
No Coax Hassle.

That's right! From this day on you can be free of the expense and nonsense of pulling bundles of coaxial cable through already overcrowded ducts.
Now, you can transmit data up to a mile between your IBM 3274 controller and up to 32 IBM 3278/9 terminals or IBM 3287 printers over a single, pencil thin, flexible, fiberoptic cable.
Fibronics' FM Multiplexer can handle all the output from your 3274 controller and compress your data on one easy-to-install cable. De-muxing takes place near your peripheral clusters.
Cost? The FM system can be installed at about 30% less than that coaxial cable you were about to buy.
Call Ken Bowes (617)872-9870, or write:
Fibronics International Inc.
655 Concord Street
Framingham, Massachusetts 01701

Fibronics
fiberoptic communications

Other deterrents to programmer turnover are the good employee relations and satisfaction that result from offering new career opportunities. Career growth is especially appreciated by those who came in at the bottom. A company's commitment to providing career growth is generally reciprocated by the employees' commitment to the company.

Trained entry-level programmers should therefore have a lower turnover rate than hired experienced programmers. The personnel department should be able to supply information on the average tenure of a hired experienced programmer. You need to estimate what you feel will be the average tenure of a trained entry-level programmer. Subtracting the time spent learning from the length of service results in the time spent doing productive work. Therefore, the productive time difference between experienced and entry-level programmers can be calculated as shown in Figure 3.

A positive result indicates you have received that much more productive time from the entry-level programmer, while a negative result indicates the experienced programmer has been that much more productive.

Since entry-level programmers are, obviously, paid less than experienced programmers, the cost of the productive time difference should be calculated. The personnel department should be able to provide average salaries for experienced and entry-level programmers. Using the formula in Figure 3, you should be able to figure the cost of the productive time difference.

A positive (negative) value indicates you paid that many dollars (PTD$) to an entry-level (experienced) programmer for the additional productive time (PTD). It is to be hoped that the cost of the extra time is less than the salary for that period of time. When the acquisition costs of hiring and training are added as shown in Figure 3 (under "Total Cost for Productive Time Difference"), the total cost for the productive time difference (PTDT$) becomes even more informative.

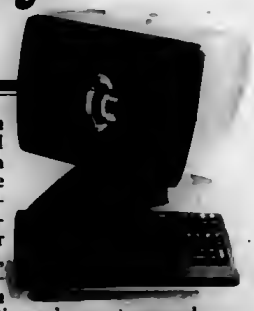
An additional cost factor not previously considered is this: If the lengths of service of an entry-level and an experienced programmer are different (LSEP and LSELP), the cost of acquiring a new employee is started over. A simple way of quantifying this is to multiply the learning curves and costs of hiring an experienced programmer by the quotient of LSELP divided by LSEP. Of course, this does not account for inflation or the loss of production time while the company looks for a replacement.

"Formulas are impressive and are great for mathematicians. But how do I really apply what is being said?"

For those of you who are wondering, we offer the following example to illustrate how the formulas might be used.

Let us assume that the company doing the hiring or training is medium-sized to large with a mid-scale or larger IBM computer system. Its primary computer lan-

High-quality graphics. Built-in hard copy. Under $5000.



It's hard enough to imagine getting sophisticated graphics at such a low price—let alone getting an integrated printer to go with it. But then again, you've never seen anything like the HP 2623 graphics terminal.

The display's the thing.

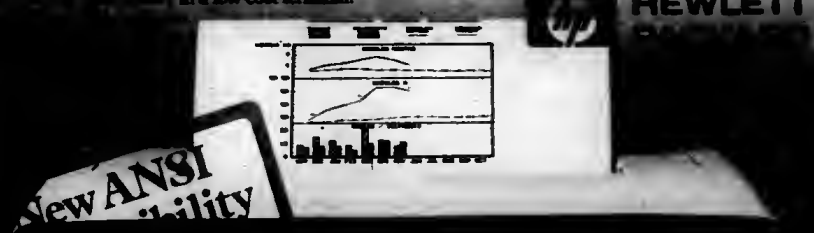
The HP 2623 gives you more than just an extremely sharp screen image. With its advanced graphics features, you can shade different areas of a chart or graph with different patterns, or even draw entire pictures in a matter of seconds.

You can vary the size of the text, rotate it, or make it italic—in any of seven languages. And in addition to HP's DSG/3000 and Graphics/1000-II software, the 2623 runs PLOT 10™ from Tektronix, SAS/GRAPH,™ [illegible] DI-3000™ and GRAFMAKER,™ [illegible] and TELL-A-GRAF.™ A remark- [illegible] in a low-cost terminal.

graphics display. And if you need hard copy, the thermal printer can dump it out in less than 40 seconds.* The HP 2623 works with computers from most major manufacturers. But no matter what system you use it with, HP's worldwide service organization can provide you with the advice, documentation and support you need.

If you'd like to see an eye-opening demonstration, contact your local HP sales office listed in the White Pages. Or just return the coupon.

*The HP 2623 is available without hard copy for $3750.



Yes! I'd like to see more of the HP 2623 graphics terminal.

☐ Please send literature on HP's complete family of terminal products.

CW7/12

Name _____ Title _____

Company _____

Address _____

City/State/Zip _____

Mail to: Hewlett-Packard, Attn: Tom Anderson, Dept. 03113, 974 East Arques Ave., Sunnyvale, CA 94086

©1983 HPTSO

IN DEPTH

Year	Salary (Monthly)	Benefits (30%)	Total Salary	Hourly Rate
Experienced Programmer				
1	1,800	540	2,340	$13.30
2	1,950	585	2,535	14.40
Entry-Level Programmer				
1	1,200	360	1,560	8.86
2	1,500	450	1,950	11.08
3	1,800	540	2,340	13.30
4	1,950	585	2,535	14.40
5	2,100	630	2,730	15.51

(In today's dollars; inflation not considered.)

Figure 4. Salary Schedule

guage is Cobol.

The "experienced" programmer has two to three years' experience in the same basic hardware and software environment into which he is being hired. However, it is assumed that he will be new to the company, to the application and to the industry. The average starting salary is $1,800 per month (see Figure 4 for assumed salary schedule).

For the entry-level programmer, we assume he has no previous data processing experience, at least two to three years' experience with the company and no previous application experience. The salary average is $1,200 per month (again, see Figure 4 for assumed salary schedule).

As mentioned earlier, the turnover rate plays an important role when one considers the overall cost of hiring and training programmers. The turnover rate per year for experienced programmers is assumed to be 30% (the industry average); for entry-level programmers, it is 12% (based on observations at different installations). Assuming a first-in, first out replacement schedule and a constant level of employment, a 30% turnover rate converts to an average length of service of 1.67 years, whereas 12% converts to 4.17 years.

Learning Curve CLCEP

Although the formula shows a linear, accumulative set of values, in reality the four major learning curve activities take place concurrently. This example (see Table 1) shows the relative percentage of time spent in each learning area and the total elapsed time during which the learning takes place. For example, "5% 2-12" means 5% of a new experienced programmer's time for months 2 through 12 will be spent learning about this aspect of his job.

Each percentage contains a factor to cover such eventualities as having to repeat a task because of ignorance of the environment.

Some further definitions of the equations' components:

DPLCEP = time necessary to learn technical standards and installation-oriented utilities and software and time for ongoing technical training (assumed 5%).

CLCEP = time necessary to learn noncomputer-related facts about the company.

ILCEP = time necessary to learn about the industry in which the company operates.

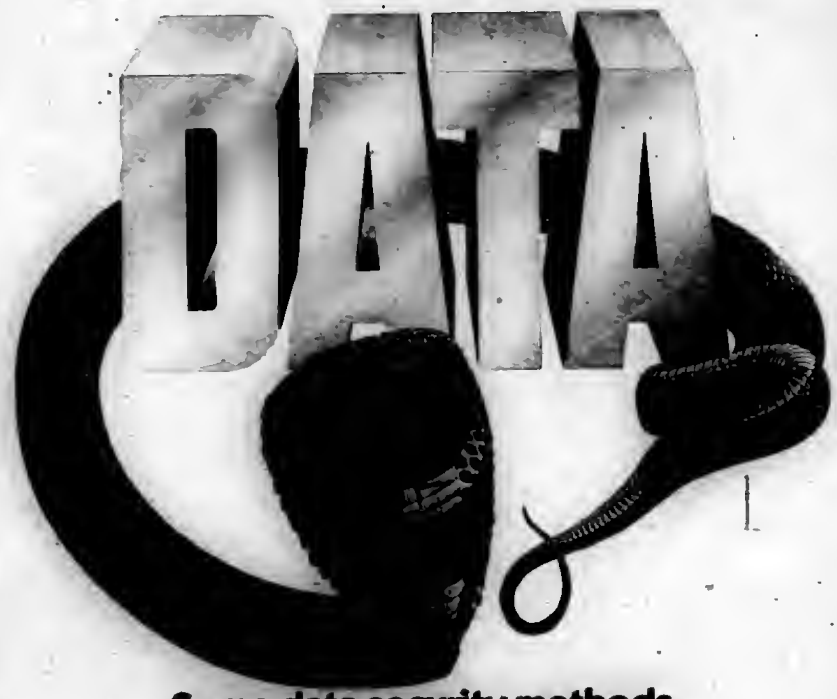
ALCEP = time necessary to learn about the specific application being developed or maintained on the project to which the programmer is assigned.

Expressed in hours (assume 22 workdays a month, eight hours a day, or 176 productive hours a month), the experienced programmer will spend 251.7 hours the first year and 322.1 hours during his tenure with the company learning about his environment. This amounts to approximately 12% of the first year or 9% for his tenure with the company (assuming 2,112 hours in a year).

Learning Curve CLCELP

The factors for the learning curve of entry-level programmers are the same as for experienced programmers (data processing, company, industry and application learning curves), but the proportions are different.

The assumption is made that the entry-level programmer has com-



Some data security methods work better than others.

TOP SECRET the state-of-the-art resource protection package for MVS works best of all.

TOP SECRET is data security at its best. Offering quick installation, phased implementation and comprehensive resource protection, TOP SECRET outdistances all other data security methods for total resource protection.

TOP SECRET immediately secures your most critical resources without impacting normal processing. Implement security with no delay and with absolutely no modifications to your operating system.

TOP SECRET is the only resource protection package that offers totally comprehensive CICS security, including file and program control and protection down to the field level.

By using the Standard MVS Security Interface, TOP SECRET becomes an integral part of your operating system. Complete compatibility with all IBM and vendor products that use Standard Security is automatic, and guaranteed, now and in the future.

TOP SECRET security comes with the same top-notch technical support that guarantees the quality and reliability of all CGA software products.

Protect your valuable data resources today. Join the MVS sites across the country that have considered every data security method and made the sure TOP SECRET choice.

Call for additional product information and your free trial.

800-543-7583.
In Ohio, call collect
(513) 890-1200.

cga
Software Products Group, Inc.

212 West National Road
Vandalia, OH 45377

Year	Month	Percent of Time	Hours	Hours for Year
1	1	25%	44.0	
	2-3	20%	70.4	
	4-6	10%	52.8	
	7-12	8%	84.5	251.7
2	1-8	5%	70.4	70.4
				322.1

LCEP = DPLCEP (10% 1, 5% 2-12, 5% 1-8) + CLCEP (2% 1-6) + ILCEP (3% 1-12) + ALCEP (10% 1-3)

Table 1. Learning Curve for Experienced Programmers

pleted his basic training program (assumed to be 360 hours, approximately nine weeks long). An additional factor in the DPLCELP (data processing learning curve) is that the entry-level programmer will need additional formal training during his first year.

It is also assumed that during his tenure with the company he will work on two different applications (see Table 2).

Based upon the above assumptions, a trained entry-level programmer would spend 410.1 hours in the first year and 839.5 hours during his tenure with the company learning about his environment. While he will take longer to come up to speed during the first year, this extra time will be absorbed during his tenure.

Figure 5 (on In Depth/26) shows the time spent in learning curves, the productive time and the cost of the productive time for each year of service. This information can be used to calculate the learning curve difference and the productive time difference.

During the first year with the company:

LCD = LCELP - LCEP
= 410.1 - 251.7 = 158.4

Or, during the employee's full tenure with the company:

LCD = 839.5 - 322.1 = 517.4
PTD = (LSELP - LCELP) - (LSEP - LCEP)
= (8,800 - 839.5) - (3,520 - 322.1)
= 4,762.6

In the first year, the experienced programmer is more productive than an entry-level programmer. However, because of the differences in the turnover rates, trained entry-level programmers will spend considerably more productive hours (4,762.6 hours or 2.25 years) during their tenure with the company. What does this mean in dollars?

During the first year with the company:

PTD $ = PTSELP - PTSEP
= 15,678.89 - 24,741.98
= -9,063.16

Or, through the employee's full tenure with the company:

PTD $ = 96,903.75 - 44,003.43
= 52,900.32

Based upon the above assumptions, while an experienced programmer is productive for 158.4 hours more during the first year, the cost of this productive time difference is $9,663.16, or $61 per hour. If one looks at a person's full tenure with the company, a trained entry-level programmer will be productive approximately 4,762.6 hours (2.25 years) more than a hired

Year	Month	Percent of Time	Hours	Hours for Year
1	1	52%	91.5	
	2-3	26%	91.5	
	4-6	21%	110.9	
	7-12	11%	116.2	410.1
2	1-12	7%	147.8	147.8
3	1-3	15%	79.2	
	4-12	5%	79.2	158.4
4	1-12	5%	105.6	105.6
5	1-2	5%	17.6	17.6
				839.5

LCELP = DPLCELP (30% 1, 15% 2-3, 10% 4-6, 5% 7-12, 7% 1-12, 5% 1-12, 5% 1-12, 5% 1-2) + CLCELP (1% 1) + ILCELP (1% 1-12) + ALCELP (20% 1, 10% 2-6, 5% 7-12, 10% 1-3)

Table 2. Learning Curve for Entry-Level Programmers

experienced programmer. The cost of this productive time difference is $52,900.32, or $11.11 per hour. This is substantially less than the hourly cost of hiring a new experienced employee.

The assumptions made for the acquisition costs for this example are listed in Figure 6. For this example, the difference in the acquisition costs of hiring vs. training are insignificant ($9,790 - $9,580 = $210). Therefore, the impact of acquisition costs on the total cost of productive time difference is minimal for this example. This may not be true for other examples. (Remember that the PTDT$ only accounts for having to

JES WRITER SUPPORT
FOR 326X and 328X PRINTERS

- All protocols, BSC, SDLC, DSC, SCS 326X, 328X local or remote
- Standard JES classes & destinations No user retraining, same JCL
- Shares printers, VM, CICS, IMS, others Printers double as RJE devices
- No mods to JES, VSI, MVS, VTAM, TCAM High reliability, low maintenance
- Automatic and attended operation

INFORMATION CONCEPTS, INC.
P.O. Box 18658 • Dallas, Texas 75218 • (214) 324-2635

END DISK CONVERSIONS FOREVER.

Now all your software can use any type of DASD device—CKD or FBA—without changes to programs or JCL.

- Place ISAM, DA, BDAM or DBOMP files on FBA disks or any CKD disk
- Eliminate costly mixed-disk environments
- Use new IBM disk types without conversion
- Convert to FBA in hours rather than months
- Reduce program execution time by half
- Use any disk type for data storage without converting to VSAM
- No modifications to IBM or user software

For a free information kit describing Instant-FBA, contact the SDI office nearest you.

SDI

New Jersey (201) 569-7212
Texas (214) 241-8730
Minnesota (612) 835-6822
California (415) 572-1200

or write: 1700 S. El Camino Real, San Mateo, CA 94402

IN DEPTH

Trained Entry-Level Programmers

Year	Average Salary* AELP$	Number of Hours LSELP	Hours Spent In Learning Curve LCELP	Productive Hours PHELP	Productive Time Cost PT$ELP
1	8.86	2,112	410.1	1,701.9	15,078.83
2	11.08	2,112	147.8	1,964.2	21,763.34
3	13.30	2,112	158.4	1,953.6	25,982.88
4	14.40	2,112	105.6	2,006.4	28,892.16
1/6 of 5	15.51	352	17.6	334.4	5,186.54
		8,800	838.5	7,960.5	96,903.75

Experienced Programmers

Year	AEP$	LSEP	LCEP	PHEP	PT$EP
1	13.30	2,112	251.7	1,860.3	24,741.99
2/3 of 2	14.40	1,408	70.4	1,337.6	19,261.44
		3,520	322.1	3,197.9	44,003.43

*see Figure 4

Figure 5. Productive Time and Costs

Acquisition Costs for Hiring a Computer Programmer

Position announcement (three ads in trade publication)	$1,000
Interview costs (transportation and expenses for one person to be interviewed)	600
Hiring costs (agency fees, 30% of annual salary)	6,480
Relocation costs (assumes 50% will have relocation costs and average cost of relocation at $3,000)	1,500
Total hard costs*	**$9,580**

*Other costs mentioned in Figure 1 absorbed as overhead and not included in calculation; therefore, this figure is understated.

Acquisition Costs for Training a Computer Programmer

Selection (assumes only a few people will be selected for training; therefore, procedure for selection is not very involved)	$ 500
Training	
Vendor-run 35-day program	5,500
In-house orientation and training (two weeks; includes development, instruction and materials, but cost is spread over several people)	600
Student salaries and benefits	3,190
Placement (absorbed as overhead as was done above)	—
Total hard costs	**$9,790**

Figure 6. Acquisition Costs for Hiring/Training Programmers

hire one experienced programmer, so it tends to be understated. The next section will shed some light on this.):

PTD$ = (PT$ELP + cost of training) - (PT$EP + cost of hiring)
= (96,903.75 + 9,790) - (44,003.43 + 9,580)
= 53,110.32

This means that the total cost of the production time difference (that is, the additional 4,762.6 hours the trained entry-level programmer will be with the company) will only cost $53,110.32, or $11.15 per hour.

Normalizing for Turnover

The above figures do not reflect the cost of replacing the experienced programmers who leave during the tenure of the trained entry-level programmers. We can get some insight into these costs by multiplying the experienced programmers' times and costs by 2.5 (the turnover rate for experienced programmers [30%] is 2.5 times as great as for trained entry-level programmers [12%]):

LCD = 838.5 - (2.5) (322.1)
= 34.25
RTD = 7960.5 - (2.5) (3,197.9)
= -34.25
PTD$ = 96,903.75 - (2.5) (44,003.43)
= -13,104.83
PTDT$ = (96,903.75 + 9,790)
- (2.5) (44,003.43 + 9,580)
= -27,264.83

In other words, over a period of 4.17 years, hiring experienced programmers will provide you with 34.25 more productive hours than hiring an entry-level programmer. These extra hours, however, will be very expensive. If you consider only salary differentials, the extra hours will cost $13,104.83. If you consider the additional hiring costs, the cost of the extra 34.25 hours is $27,264.83.

While the preceding figures are impressive, they are only part of the story. For example, they do not consider the costs in terms of delays and low employee morale that occur while a company is seeking a qualified replacement.

There are many factors involved in the decision of whether it is worthwhile to train entry-level programmers. Two of these considerations are productivity and cost.

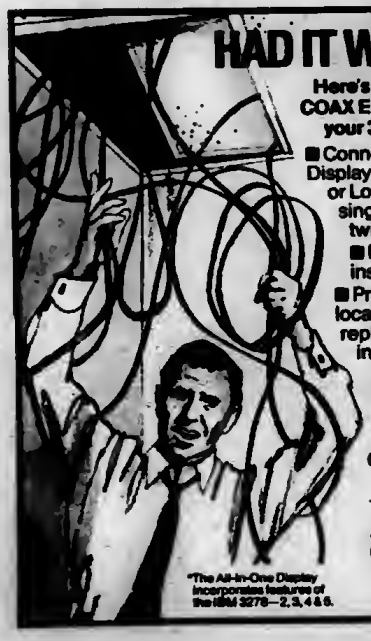
The example provided in this article helps illustrate a model that can be useful in evaluating these considerations. While this example was not intended to be universal to all companies, it did illustrate that when one views the difference in productivity between hired and trained programmers and the cost of this difference, the case for training becomes much stronger.

If you disagree with any of the figures or assumptions used in the example, and we expect you will, we invite you to "plug in your own figures and crank the handle."

About the Authors

Bradley W. Nelson is an independent consultant based in Renton, Wash. He has 16 years' experience in data processing and has spent half of that time in computer-related education/training. His background includes teaching and consulting in an industrial environment.

James W. Lowrey Jr. has more than 19 years of data processing experience in a variety of technical and managerial positions. He has managed data processing education departments for Los Angeles County and Crocker National Bank and is currently head of communications and data processing education services for Hughes Aircraft.



HAD IT WITH COAX?

Here's how the new Lee Data COAX ELIMINATOR™ can solve your 3270 cable problems:

- Connects up to 8 All-In-One Displays* to a Lee Data Remote or Local Controller via a single coax cable or a twisted wire circuit.
- Reduces coax cable and installation cost up to 85%.
- Provides access to locations beyond 5000 feet, replacing remote controllers in some instances.
- Achieves local channel response times for devices at remote locations.

Call Our System Specialists
800-328-3996

LEE DATA CORPORATION
10208 Crosstown Circle
Minneapolis, MN 55344
(612) 932-0300

*The All-In-One Display incorporates features of the IBM 3278—2, 3, 4 & 5.

BATCH REPORT RETRIEVAL

CPMS®-CICS Print Management System

- Route reports to any CICS printer
  - Reduces need for RJE and couriers
- Display batch reports on CICS 3270s
  - Reduces printing costs
- VSI, MVS, CICS/VS, JES I, JES II
  - No modifications to SCPs or appls.

Site license under $5,000

H & W Computer Systems, Inc.
P.O. Box 4173
Boise, Idaho 83704 • (208) 377-0336

Microfloppy Drive, Color Plotter Bows

ARLINGTON HEIGHTS, Ill. — Amdek Corp. has introduced a microfloppy disk drive and a low-cost four-color plotter designed for personal or business computers.

The Micro-Floppy dual disk drive reportedly offers a 1M-byte capacity and is plug-compatible with standard 5-in. floppy disk drives. The new drive reportedly has a built-in power supply and accommodates two new 3-in. Micro-Floppy disk cartridges.

The Micro-Floppy disk cartridge features a flip-type, hinged-cover head that protects the disk from dust, scratches or fingerprints. The single-sided recording capacity is 125K- or 250K bytes for both sides with double-density capability.

The Model DXY Plotter reportedly has a 10-in. by 14-in. effective plotting range and figures may be easily drawn using the CONTROL or BASIC commands. The plotter functions may be expanded by adding additional read-only memory.

The Model DXY is furnished complete with four pens, pen holders and chart hold-downs. A Centronics Data Computer Corp. interface is furnished to permit easy connection, Amdek said.

The Micro-Floppy disk drive unit is priced at $899; its cartridges are priced comparably with standard 5-in. disks, according to the vendor.

The DXY Plotter is priced at $949 and is available for October delivery, the vendor said from Suite E, 2420 E. Oakston St., Arlington Heights, Ill. 60005.

Univac Adds Two Models To System 80 Mini Family

BLUE BELL, Pa. — Sperry Univac has announced two additional models of its System 80 minicomputer family. The System 80 Model 4 and Model 6 offer up to 4.8G bytes of disk storage and a disk cache feature that improves I/O throughput, according to a Univac spokesman.

The new processors are performance upgrades for the Models 3 and 5 processors, which were announced in April 1980. The Models 4 and 6 can be used as stand-alone units or as part of a distributed network, the spokesman noted.

The Model 6 processor offers approximately 56% greater internal performance than does the Model 4, according to Univac. Main storage on both the Models 4 and 6 starts at 512K bytes and reaches a maximum 4M bytes.

Enhanced Software

The Models 4 and 6 feature enhanced software said to offer improved job scheduling, optimized shared-file performance, enhanced memory management and a reported performance increase in the firm's Escort programming language.

Members of the System 80 series run under Univac's OS/3 operating system, which supports multiprogramming and a full range of programming languages, the vendor said.

Like the Models 3 and 5, which can be upgraded to the Models 4 and 6, the new systems use a multiple bus architecture, emitter-coupled logic chips and large-scale integration.

A high-speed streaming tape drive for disk media backup comes with Models 4 and 6. The unit has a data rate of 160K byte/sec; the recording mode is phase-encoded.

The disk cache capability available with Models 4 and 6 reportedly reduces the number of read operations performed on the disks. The facility consists of system microcode and a portion of main storage that is set aside for use as a cache buffer, the vendor said.

In conjunction with the announcement of Models 4 and 6, Univac said that its 8470 disk drive, along with the 8417 and 8419 drives, now runs on all models of the System 80 line. The 8470 gives users almost 5M bytes of disk storage.

A newly announced integrated disk channel available on the Models 4 and 6 allows users to attach eight 8470 drives in addition to the eight 8417/8419 disk drives on a dedicated channel, making the total disk drive capacity 16 drives, Univac said.

Univac also announced the Model 2 workstation for the Models 4 and 6 processors. The Model 2 workstation, which is said to be fully compatible with the current Model 1 workstation, has a screen by-

(Continued on Page 53)

HP Unveils Modularly Designed Micro System

PALO ALTO, Calif. — A modularly designed microcomputer system that features a detachable CRT monitor, a 270K-byte flexible disk drive and up to 512K bytes of random-access (RAM) memory was unveiled today by Hewlett-Packard Co.

The HP 86 is similar to the firm's previously introduced HP 85 desktop computer except that it includes a detachable CRT screen, more professionally-oriented software and a lower price tag.

The basic system costs $1,795 — the first to carry a price of less than $2,000, an HP spokesman said.

At the same time, the firm introduced an expanded-memory version of its HP-87A computer, which was unveiled in March. The HP 87XM has built-in 128K bytes of user memory that reportedly can be expanded to 640K bytes. It also has 48K bytes of read-only memory, 16K bytes of display control and a built-in, rather than detached, HP-IB interface, the spokesman noted.

The HP 86 is positioned between the entry-level HP 85 and the expanded memory HP 87A. It has 128K bytes of memory, 64K bytes of RAM, 48K bytes of operating system read-only memory (ROM) and 16K bytes devoted to the display.

The basic system has a microprocessor, keyboard and

(Continued on Page 53)

The HP 86 features software for information management, accounting and word processing.

THERE'S ALWAYS ROOM FOR ANOTHER VIEWPOINT

VIEWPOINT

For End Users:
The ADDS computer display terminal any business person can afford. In fact, you could own *three* of our terminals with full-size, two position tilt screens, moveable typewriter-like keyboards—all in a smaller, space-saving cabinet—for the price of two ordinary terminals.

VIEWPOINT/3A *PLUS*

For End Users:
Offering the same reliability as the original Viewpoint—and at the same list price—our 3A *PLUS* is also compatible with the Lear Siegler ADM3A and other competitive terminals.

NEW, VIEWPOINT/60

The smart editing terminal you have been looking for. With its small size, moveable keyboard, elaborate visual highlighting, programmable function keys, and line drawing graphic mode, it is the *lowest cost product* offering these outstanding features. It *also offers a migration path* from ADDS' *Regent**60 and 40.

SOMETHING EXTRA IN EVERYTHING WE DO

ADDS Applied Digital Data Systems Inc.

For more information, call or write: Applied Digital Data Systems Inc., 100 Marcus Blvd. Dept. MCV, Hauppauge, N.Y. 11788 (516) 231-5400

**Regent is a registered trademark of Applied Digital Data Systems Inc*

Mini Bits

Digilog Business Cuts Price Of Systems 1000, 1500, 1800

MONTGOMERYVILLE, Pa. — Digilog Business Systems, Inc. has announced price cuts on its 5ystems 1000, 1500 and 1800, and the Work Station 900 business computer.

Digilog credited "increasing economies associated with volume production and efficient manufacturing capacity" for the price reductions of the Zilog, Inc. Z80A-based desktop computers.

The System 1000-I now costs $3,995, the System 1000-II costs $4,995, the System 1500-I costs $7,995 and the System 1500-II costs $8,995.

In addition, the System 1800-I will cost $9,495, the 5ystem 1800-II will cost $10,195 and the Work Station 900 costs $2,495.

Digilog is located at Welsh Road and Park Drive, P.O. Box 355, Montgomeryville, Pa. 18936.

Firm Unveils Own Version Of VT-18X Upgrade Kit

HOUSTON — C. Itoh Electronic, Inc. has introduced its own version of Digital-Equipment Corp.'a VT-18X upgrade kit for personal computers.

The CIT-188 reportedly allows both C. Itoh's CIT-101 and DEC VT100 terminals to be upgraded to a 64K-byte Digital Research, Inc. CP/M-compatible, Zilog, Inc. Z80-based personal computer. Upgraded terminals do not lose any terminal features and will continue to operate in their accustomed environments, the vendor said.

The kit consists of a 64K-byte Z80-based computer board, a dual double-density double-sided 5¼-in. floppy disk and all necessary hardware, cables and instructions. The configuration is priced at $2,575.

C. Itoh can be contacted at 5301 Beethoven St., Los Angeles, Calif. 90066.

STC Enhances 6000 Series To Support Up to 1M Byte

WALDWICK, N.J. — STC Systems, Inc. has expanded its 6000 series of minicomputers to support up to 1M byte of main memory.

The firm said that the memory enhancement now allows the system to support up to 256 interactive terminals. 5maller System 5000 processors can be field-upgraded to the Series 6000, the vendor said.

A Series 6000 processor with 1M byte of main memory costs $107,900, the vendor said from 4 North St., Waldwick, N.J. 07463.

Micro System Z80 Based, Has Accounting Software

SAN DIEGO — Dimension Systems Corp. has announced a 1M- to 40M-byte microcomputer system that comes with accounting software.

The Zilog, Inc. Z80-based microcomputer handles up to 16 users and operates under Digital Research, Inc.'s CP/M and MP/M operating systems. Both the desktop and floor models are manufactured in cabinets of walnut, oak or teak.

The 1M-byte system, including CPU, 120-char./sec printer and five accounting software modules, costs $6,650. The firm also offers other software such as legal, dental and medical packages.

Dimension is in Suite 202, 9948 Hilbert St., San Diego, Calif. 92131.

Multimode Printer Features Graphics Capabilities

HAUPPAUGE, N.Y. — North Atlantic Industries, Inc. has announced the Qantex 7020, a multimode printer that reportedly features near letter-quality and graphics capabilities.

The unit has three selectable print modes and operates in either a high-speed draft-copy mode of 180 char./sec or at 75 char./sec in a near letter-quality mode. In a graphics mode, the unit has a resolution of 144 by 72 bits mapped dot/in. at a repetition rate of 900 dot/sec, the vendor said.

The dot-matrix printer costs $1,625, the vendor said from 60 Plant Ave., Hauppauge, N.Y. 11787.

Wabash Minidiskette Line Features 96 Track/In.

ROLLING MEADOWS, Ill. — Wabash Datatech, Inc. has announced a line of 96 track/in. double-density minidiskettes in single- or double-sided variations and one-, 10- and 16-sector formats.

Each diskette is certified for use at 77 or 80 tracks and reportedly meets or exceeds Ansi and ISO standards.

Single-sided versions cost $5.95 each and double-sided versions cost $7.95 each, a spokesman said from 5uite 400, 2 Continental Towers, 1701 Golf Road, Rolling Meadows, Ill. 60008.

Winchester Disk Expands Affinity 16 Applications

LOS ANGELES, Calif. — TRW-Fujitsu Co. has announced a Nippon Peripherals Winchester disk for the Fujitsu Affinity 16 desktop computer. The disks are said to expand the applications of the Affinity 16 to include the high-performance processing needed in more comprehensive business systems.

Available in 5M or 10M bytes, the disk features an average access time of 170 msec and a transfer rate of 5M bit/sec, according to a vendor spokesman.

The 5M-byte disk is available for $4,000, the 10M-byte disk for $5,700 from TRW-Fujitsu Co., No. 620, 9841 Airport Blvd., Los Angeles, Calif. 90045.

Disk/Tape Combo Designed For IBM Personal Computer

HUNTINGTON BEACH, Calif. — An add-on Winchester disk/cartridge tape combination designed for the IBM Personal Computer has been unveiled here by Cybernetics, Inc.

The Cyberdrive reportedly features high performance levels and an integrated business-oriented backup device. The integrated minicartridge tapes used for backup of data allows dumping of up to 10M bytes of data, for example, in about 10 minutes, according to the vendor.

This product sells for $5,750. Cybernetics is located in Suite 208, 8041 Newman Ave., Huntington Beach, Calif. 92647.

In computers, think IBM first... From that point on- think CMI

When you decide which IBM system best fits your needs, then decide on CMI. Few companies can match the level of professionalism CMI is noted for.

Our experts in Marketing, Financial Services, Operations and Sales have proven over the years that having CMI on your side is a decided edge

S/E SUPPORT
S/E support and/or test time can be provided with a system supplied by CMI to ensure a smooth conversion.

IBM ACCEPTABILITY
All CMI supplied equipment is certified eligible for an IBM maintenance agreement.

BRANCH OFFICE SUPPORT
CMI's plan is to keep you as an IBM customer running on IBM Systems

DELIVERY & PRICE
CMI promises...Fast delivery
Lower purchase price
Lower lease rates
More flexibility

In addition, we can structure a Purchase/Leaseback on your present system and save you money while offering upgrades, lease extensions and purchase options.

CMI Since 1969 CORPORATION
755 W. Big Beaver, 19th Floor, Troy, Michigan 48084
(313) 362-1000

HP-86 Micro Said Cheaper, Offers Detachable Screen

(Continued from Page 51)

four ports, which can accommodate HP's Model 82900 plug-in CP/M operating system, a modem, extra memory modules and additional ROM's. Optional equipment includes the Model 9130 flexible disk drive ($850), which features a 270K-byte capacity and uses double-sided, double-density disks; a 9- or 12-in. CRT display, priced at $295 and $325, respectively; and a number of printers, including the HP 82905B — a dot-matrix impact printer with compressed and expanded type and a variety of print formatting options. That printer sells for $795.

Software for the computer includes packages written for HP's Series 80 Basic and Digital Research, Inc.'s CP/M operating systems. CP/M-based applications packages for the systems are supplied by Peachtree Software, Inc. and include general ledger, accounts receivable and accounts payable programs.

All of the software is priced at about $750 each, the vendor noted.

The HP-86 reportedly can also use a variety of word processing and electronic mail software, HP's Visicalc Plus and Ashton-tate's dBase II data base management software.

A complete HP-86 system is priced at less than $3,900, the vendor said.

The expanded memory HP-87XM is said to have a basic 128K bytes of memory, which can be boosted to 640K bytes with the addition of a plug-in module.

The HP-87XM costs $2,995.

Additional information on the two systems and other HP products can be obtained from the firm's local sales offices.

Find any software for any micro, mini, or mainframe.
SOFSEARCH outperforms all software directories because it's not a directory. SATISFACTION GUARANTEED.

Call
1-800-531-5955
In Texas, 512-340-8735

SOFSEARCH™
software locator service
The world's first software locator service.
CCS Incorporated P.O. Box 5276 San Antonio, Texas 78201

System 80 Gets Models 4 and 6

(Continued from Page 51)

pass capability.

A basic Model 4 — including processor, integrated controller for local workstations, diskettes, paper peripherals, console, disk cache, 524K bytes of main storage, one 118M-byte disk drive, one manual diskette drive, one 180 line/min. printer, system control and extended system software, the RPG-II programming language, editor and Escort — can be purchased for $98,906 or leased for $2,994/mo on a five-year agreement including maintenance. A similarly configured Model 6 carries a price tag of $126,886 and a leasing fee of $2,994/mo for five years.

First customer deliveries of the system are scheduled for this month. Univac is located at P.O. Box 500, Blue Bell, Pa. 19424.

Controller Offered As RLO Alternative

SUNNYVALE, Calif. — A single-card disk controller has been introduced by Advanced Electronics Design, Inc. as an alternative to Digital Equipment Corp. RL01, RL02 and RX02 controllers.

The Winc-05 is a dual-width embedded controller that is plugged directly into the CPU card cage. The system reportedly performs burst data transfer at 625K byte/sec. Up to four drives in a variety of Winchester and floppy disk combinations may be controlled by a single Winc-05.

The Q-Bus-compatible controller costs less than $2,000. A typical system comprised of one 10M-byte Winchester and one 5¼-in. floppy costs $6,800 from the firm at 440 Potrero Ave., Sunnyvale, Calif. 94086.

PROGRAMMED FOR PERFORMANCE

ACM-Siggraph

ACM-Siggraph

Evans and Sutherland Computer Corporation

ACM-Siggraph

Among all consumer science magazines, OMNI ranks #1.

#1. Greatest total adult audience, (5.4 million).
#1. Largest total male audience.
#1. Highest single copy sales.
#1. In advertising pages (First six months '82).
#1. In level of reader discretionary income.
#1. Most cost-efficient in reaching adults who purchase computer equipment.

PLUS 27% of all OMNI readers own home computers and 50% are potential buyers of home computers within the next year.

For further information contact: Howard Plissner at OMNI Magazine, 909 Third Avenue, New York, N.Y. 10022, 212/593-3301 or Mike Speciale, Hajar Associates, Inc., 280 Hillside Avenue, Needham Heights, Mass. 02194, 617/444-3946

OMNI
THE ORIGINAL.

ADVERTISE IN THIS OCTOBER ANNIVERSARY ISSUE. CLOSING DATE AUGUST 5, 1982.

OMNI Primary Study 1982 MRI Spring 1982

Highest OA Salaries on West Coast

Study: Top OA Pay in Diverse Regions

By Bruce Hoard
CW Staff

WILLOW GROVE, Pa. — Office automation workers are earning the highest average weekly salaries on the West Coast and in a four-state region comprising Arkansas, Texas, Oklahoma and Louisiana, according to the *Eighth Salary Survey* conducted recently by the International Information/Word Processing Association (IWP).

For instance, the study found that information managers averaged $648.55 in the Arkansas-Texas-Oklahoma-Louisiana area. Word processing supervisors averaged a high of $389.21 in the same area.

The high information manager salary was $1,001, found in both Regions 1 (Montana, North Dakota, South Dakota) and 5 (Wisconsin, Iowa, Minnesota). The high individual word processing supervisor salary was found in Region 1 at $1,001.

A total of 2,017 companies and 20,637 employees were canvassed during the survey, which broke data down into 10 Zip Code regions, 20 metropolitan areas and 27 industries.

Keying in on Five Jobs

Although 15 job titles were investigated, *Computerworld* keyed in on five:

- Information manager.
- Word processing supervisor.
- Word processing specialist II/assistant supervisor.
- Word processing manager.
- Word processing trainer.

An information manager is defined as someone who may be a vice-president or an assistant to the vice-president, with total responsibility for all aspects of an organization's office systems, including word processing, administrative support and other information processing functions.

A word processing supervisor is responsible for the operation of a word processing center (or section within a large center).

Word processing specialist II/assistant supervisors and word processing managers fared best in Zip Code Region 9 (California, Washington, Oregon, Hawaii), where their salaries averaged $300.86 and $442.68, respectively.

The highest word processing specialist II/assistant supervisor salary was $575, which was recorded on the West Coast and in the Region 6 (Illinois, Nebraska, Kansas, Missouri) area. The highest word processing manager salary was found in both Regions 1 (Pennsylvania, New York, Delaware) and 4 (Michigan, Indiana, Ohio, Kentucky). That figure was $1,001.

The IWP described a word processing specialist II/assistant supervisor as someone who is able to operate all the information processing equipment within the installation. Responsibilities include coordinating and assigning work, analyzing requirements for specific projects and communicating with users and others.

A word processing manager is responsible for the overall operation of a word processing center, including the guidance of supervisors, personnel administration, staff requirements, user liaison and evaluation and design and implementation of future word processing systems.

The highest average word processing trainer salary was $324.89 in Region 1. The individual high was $650 in Region 9.

A word processing trainer must have at least two years' experience operating word processing systems and spend a majority of the time training new operators, among other qualifications.

Low Salaries

On the low end of the scale, Region 9 — the area with the highest average word processing specialist II/assistant supervisor salary — was the site of the lowest, at $107.

Other lows included:

- Word processing manager, $212, Region 3 (Tennessee, Mississippi, Alabama, Georgia, Florida).
- Word processing supervisor, $107, Region 9.
- Information manager, $237, tie between Regions 6 and 0 (Maine, Connecticut, Vermont, New Hampshire, Massachusetts, New Jersey, Rhode Island).

The 80-page report also covers Canada and costs $40, according to the IWP, which is located at 1015 N. York Road, Willow Grove, Pa. 19090.

OA Technology — Part 5

Execs See 'Long Road Ahead' for OCR

By Bruce Hoard
CW Staff

This is the final article in a series of updates on office automation technologies.

Although optical character recognition (OCR) technology has come a long way in the past few years, some experts feel there is still plenty of room for improvement.

Perhaps the biggest stumbling block in the path of OCR technology is the inability of devices to recognize multiple fonts, or type faces. That is changing, but slowly, according to Richard Matthews, vice-president of engineering at Dest Corp., a recent entry into the OCR market.

The latest machines recognize up to eight fonts, most of which are used with popular typewriters, he said.

Over the past five years, OCR has been boosted into a position of viability by improvements in optical electronics technology, Matthews said. He noted that up until five years ago, the diodes used to scan documents were limited to arrays of 128, not enough to scan a page properly.

Now, diode arrays contain as many as 2,000 diodes in a row, providing the ability to scan fully an 8½-in. page without the physical motion required of the earlier models, he said. The additional diodes, coupled with advances in microprocessor and software technologies, have combined to drive down the costs and sizes of OCR devices, the vice-president commented.

According to Matthews, the OCR page-reading process involves inserting a typed page into the OCR device, which begins to scan it line by line. Each line is digitized into a graphics bit-map representation, and each character is reviewed in graphics form through the use of various algorithms. The algorithms help the device determine what is, and what is not, a letter.

Whereas a dot matrix printer develops characters by taking bits to form dots and print letters on a page, OCR takes fully formed characters and translates them back into dot form so that it can determine letters, he said.

He predicted graphics reproduction will be an important future OCR application. "That's a market we see growing very fast," Matthews noted.

Richard Lindenmuth, vice-president and general manager of Burroughs Corp.'s Imaging Systems Division, said the OCR market is still quite modest, having achieved only about $25 million in sales yearly, al-

(Continued on Page 56)

SAS* USERS USING SAS*

CRWTH COMPUTER COURSEWARES

Yes, I'd like more information about the new USING SAS course ☐ and your other 8 courses ☐.*

NAME _____
TITLE _____ COMPANY _____
ADDRESS _____
_____ PHONE _____

CRWTH COMPUTER COURSEWARES
12655 Washington Blvd., Suite 205, Los Angeles, California 90066
(213) 391-6788
"Fulfilling the promise of the Information Center"

Page Readers Get Price Cut

BEDFORD, Mass. — ECRM, Inc. cut prices on its Concept series of optical character recognition page readers.

The Concept 2 page reader is now priced at $17,500, down from $19,900; the Concept 3 page reader has been reduced from $25,900 to $22,000; and the Concept 4 page-reader has been reduced from $29,600 to $27,250.

Base pricing on all the Concept models will include one standard recognition and one interface, either asynchronous or binary synchronous communications (BSC). Additional asynchronous or BSC interfaces are available for $1,500 each, ECRM said from 205 Burlington Road, Bedford, Mass. 01730.

From System/34

Oak Software Converts WP to System/38

CLEARWATER, Fla. — Oak Software, Inc. has completed the conversion of its word processing system to the IBM System/38.

Originally written for the IBM System/34, Oak's new WP system reportedly adds full word processing functions to the System/38 and functionally compares with stand-alone systems with the added advantage of being resident on a mainframe.

The Oak system includes a full-screen text editor with 16 commands, automatic pagination, automatic table-of-contents generation, math functions, a built-in name and address file, access to data files and spelling verification. A guarantee that any function that can be found in any other System/34 or System/38 word processor will be added at no additional charge, the vendor spokesman said.

The package price of the system is $3,500 (available for $2,500 for the System/34) and includes all programs and procedures, a 120-page user manual and training course and phone support, according to the vendor.

The system is available from Oak Software at 300 S. Duncan Ave., Clearwater, Fla. 33515.

'Dictapak' Library Package Debuts For Dictaphone WP Systems

RYE, N.Y. — Dictaphone Corp. has introduced a software library package designed for use with its word processing systems.

The Dictapak consists of several applications packages, including the Legal Management System (LMS), designed for use with the dual-display word processor. The LMS software reportedly creates client bills, financial reports, management summaries, docket control and calendaring for law offices.

Dictapak also features enhanced versions of word processing and various other application software. It also reportedly enlarges the flexibility of Dictaphone's dual-display word processor, which previously offered records processing and math processing functions.

The product costs $250, Dictaphone said from 120 Old Post Road, Rye, N.Y. 10580.

Now you can do things with your IBM computer that you've always wanted to do.

Things that will solve your end users' problems. And yours. Without changing your existing IBM environment.

Your hardware, our software

Spectra is our off-the-shelf software. It's a fully-integrated, on-line system developed by Xerox for medium to large IBM computers. It offers a full range of applications for manufacturing, distribution and financial functions. As well as a complete line of software management support systems.

With Spectra, you can avoid years of development and have a system up and running in a few months. You simply phase it into your existing environment and start cleaning up your applications backlog.

You stay in control

Spectra is ideal for single or multi-plant environments considering a closed-loop manufacturing system. It's fully compatible and upgradable with installed IBM CPUs as small as the 4300 series, all the way up to the 3081.

It's proven, too. Its features have been enhanced and refined through years of use by hundreds of satisfied customers. But that's not all. We'll continue to update the system, ensuring that you always have the best software available.

Two ways to get there

You can get the benefits of Spectra by using it on your IBM computer immediately. Or, as an option, start with the same software on our on-line, remote computer services. Then, when you're ready, just move the software and data base in-house.

We'll get you up and running with a comprehensive training and implementation program. After that, we'll always be on hand to help in any way we can.

To find out more about Spectra software, call toll-free (800) 323-2818, Operator 146. In Illinois, call (800) 942-1166.

Or return this coupon. We'll mail you our new *Spectra Capabilities* brochure. And you'll be on your way to doing the things you've always wanted to do with your IBM computer.

Xerox Computer Services
c/o Ron Rich, 5310 Beethoven Street
Los Angeles, California 90066

Send me your *Spectra Capabilities* brochure.
My company is a:
☐ Manufacturer ☐ Distributor
I'm interested in your software for:
☐ IBM 43XX ☐ IBM 370 ☐ IBM 30XX

Name/Title _____
Company _____
Street _____
City _____ State _____
Zip _____ Tel. ( ) _____

C7/12

XEROX

XEROX® and Spectra are trademarks of the XEROX CORPORATION.

OCR Has 'Way to Go'

(Continued from Page 55)

though he expected that figure to jump to $50 million within three years.

Those figures are based on a price range for OCR page-reading machines running from $7,000 to $30,000. He added that larger, more sophisticated machines are available for $100,000 and more.

As far as leading vendors are concerned, he said Burroughs, Compuscan, Inc. and Hendrix, Inc. all share between 25% and 30% of the market.

The drawbacks of OCR technology have included high prices, excessive size, too much required training and the limitation to certain alphanumeric characters. He also said users have to decide what fonts they want to reproduce before they invest in equipment.

The real impact of OCR will be felt in the integrated automated office, he claimed, noting OCR readers will serve as input devices to personal computers, word processors and intelligent printer/copiers, tying them into a system.

As it is now, there is no practical way to file or distribute incoming mail. "What I will need is some input device, probably very small, with the processing being done even remotely," Lindenmuth said. "In my estimation, OCR technology will be the key — critical and absolutely necessary — to the office of the future."

'Smalltalk': Will It Usurp CP/M, Unix?

By Susan Blakeney
CW Staff

PALO ALTO, Calif. — Deep inside Xerox Corp.'a Palo Alto Research Center (Parc) lurks some rather unusual software, which one market research firm believes could blast existing operating systems out of the water. Just how and when it will be released is not yet known, but some think Xerox better hurry up before it'a too late.

Xerox'a anticipated Smalltalk, has been labeled everything from a next-generation programming language to a new type of operating system to a major software environment. It is actually an object-oriented language for microcomputers that "will dwarf Unix and CP/M," according to consultant Michael Killen of Strategic, Inc., of San Jose, Calif.

(Continued on Page 62)

Recession Seen Changing Face Of DP Consulting Market

By Bob Johnson
CW New York Bureau

NEW YORK — The recession is changing the complexion of the DP consulting market, according to a New York consultant'a representative here who explained that tight money has forced users to cut back on consulting work and to demand top-notch technical skills from the consultants who are hired.

Sandra Peters, a principal in the consulting firm of Technical Representatives, claims that changes in her business' daily operation reveals that the money crunch has shaken up the once very comfortable consulting market. Among the changes she cited is a reduction in fees for the independent consultant, who once commanded salaries of $1,000 a day and up but are now settling for $200 to $300.

The cutbacks in DP spending are affecting independent consultants much more than large consulting firms, Peters said. She knows of three major New York financial institutions which recently "laid off" between 200 and 300 consultants.

Consulting in DP areas that are not particularly time-sensitive or crucial to corporate operations are being put off until the recession eases. "Only skills so specialized and critically important to the development of time-sensitive projects that cannot be found within the corporation are in demand," she stated.

As a result, independent consultants are being forced to seek full-time positions as

(Continued on Page 63)

DP Firms Cite Recession For Layoffs

The recession has been blamed for a series of layoffs in four computer companies across the nation.

Texas Instruments, Inc. of Dallas recently let go 125 of its administrative employees, bringing the total number of layoffs in the past 16 months to 7,000. "It is part of a continuing need to cut expenses in the economic recession," a TI spokesman said.

The 125 employees were all located in the Dallas area.

Poor Economic Climate

Northern Telecom, Inc. of Minnesota recently laid off 155 workers. The cutbacks were attributed to a restructuring of the organization, which is being implemented earlier than expected, according to a company spokesman, because of the poor economic climate.

Another Twin City-based company, Control Data Corp., also recently let go about 260 manufacturing workers in its peripherals division — Magnetic Peripherals, Inc. (MPI). "Basically, we are attempting to reduce inventory in the peripherals area," a spokeswoman said. "There'a a slowdown in the OEM marketplace."

The MPI employees who received notice had no more than a year'a tenure and were given the option to apply for other jobs in the corporation or return to school on the firm's tuition reimbursement program, she added.

On Long Island, N.Y., 160 manufacturing and support personnel were let go from terminal manufacturer Hazeltine Corp.

The layoffs were made "primarily to match our terminal sales with the personnel," according to a company spokesman. "The recession is taking its toll on us as it is on other companies."

Limited Partnership Develops VLSI-Based Supercomputer

By Bohdan O. Szuprowicz
Special to CW‡

Somewhere in the world are 4,360 persons who late last year invested a total of $55 million in Trilogy Computer Development Partnership Ltd., which is financing the development of an IBM-compatible, large-scale, high-performance supercomputer that is based on very large-scale integration (VLSI) technology.

What all those thousands of "limited" partners have in common is a minimum personal net worth of at least $100,000 over and above the $10,000 minimum investment in the partnership and a $65,000 minimum annual income.

This is a U.S. Securities and Exchange Commission requirement regulating public investment in limited partnerships that are basically speculative

Analysis

and relatively nonliquid investments.

The management of Trilogy Systems Corp., the company developing the supercomputer, includes Dr. Gene Amdahl of IBM and Amdahl Corp. fame; Carlton Amdahl, the founder of Magnuson Computer Systems, Inc.; and Richard Eppel, until recently an engineering vice-president at Control Data Corp., responsible for the CDC Cyber 170 supercomputer architecture.

It is no small wonder that with a management team of that caliber, Trilogy had no problem raising the $55 million development capital with the assistance of Merrill Lynch, which is the largest stockbroker organization in the world. Despite the large number of investors, it was not a public issue because it was done in the form of a research and development limited partnership, and it therefore reaped relatively little publicity.

American investors in such a partnership enjoy tax shelter advantages and can deduct their share of any losses of the general partner from their personal tax obligations.

The fledgling company ex-

(Continued on Page 58)

Instant Cure for Computer Indigestion

The Beall Channel Switch Directs critical [illegible] services to another CPU when failure occurs. Allows specific peripherals to serve more than one computer. Redrives all CPU signals to give you far more flexibility for physical placement of peripherals.

And Beall does all of this less expensively, more reliably and with less opportunity for operator confusion than anyone else.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Want to prescribe more facts? They're in our new brochure. Write or call for it today.

John Beall & Company, Inc.

R&D Tax Incentive Aids Supercomputer Plan

(Continued from Page 57)

pects to suffer losses for at least the first three years of operation before its first supercomputer is introduced sometime in 1984. After that there is a good chance that the partnership may dissolve into a public corporation, and the partners stand to make many times their already tax-deducted investment.

It's all perfectly legal and results from a 1981 research and development tax incentive passed by Congress to stimulate venture capital investment in the U.S.

What Trilogy Systems is trying to do is develop a supercomputer that will capture a big share of the high-end IBM-compatible computer market of the next generation. This is the market which in 1975 saw about 250 very large systems worth $1.1 billion shipped. By 1980 that market had increased to 1100 supercomputers valued at about $3.6 billion; 1985 forecasts put the market at 2000 systems worth about $7 billion.

The current supercomputers of the IBM 3081 caliber with which Trilogy must compete offer processing speeds of up to 10 million instructions per second (Mips), which is already well up from the 3 Mips speed range of the large IBM 370/168 computers of the mid-1970s. Trilogy is developing its supercomputer to compete in the 12 Mips to 15 Mips range, which apparently can be achieved without increasing the unit price of future supercomputers by the proper utilization of very large-scale integration (VLSI) semiconductor technology.

This is where the plot of the supercomputer partnership thickens a bit. In Bermuda, it turns out, exists a Trilogy Ltd., which is a holding company that sold the rights to use its semiconductor technology to Trilogy Systems and made commitments to sell any computers that Trilogy Systems may develop. It is not entirely clear exactly who Trilogy Ltd. is, but CII-Honeywell Bull of France is one of its shareholders.

Trilogy Systems itself, the general partner, is the hardware development company that received a contract from the partnership to develop the VLSI logic and the supercomputer design. By the end of 1981, Trilogy Systems already had 117 employees in an experimental laboratory in Santa Clara, Calif., and was finalizing a computer-aided design program. It was getting ready to move into more suitable facilities in Cupertino — located in the heartland of Silicon Valley — where no doubt it will be able to draw upon much design and logic testing talent in the future.

Many Fingers in the Pie

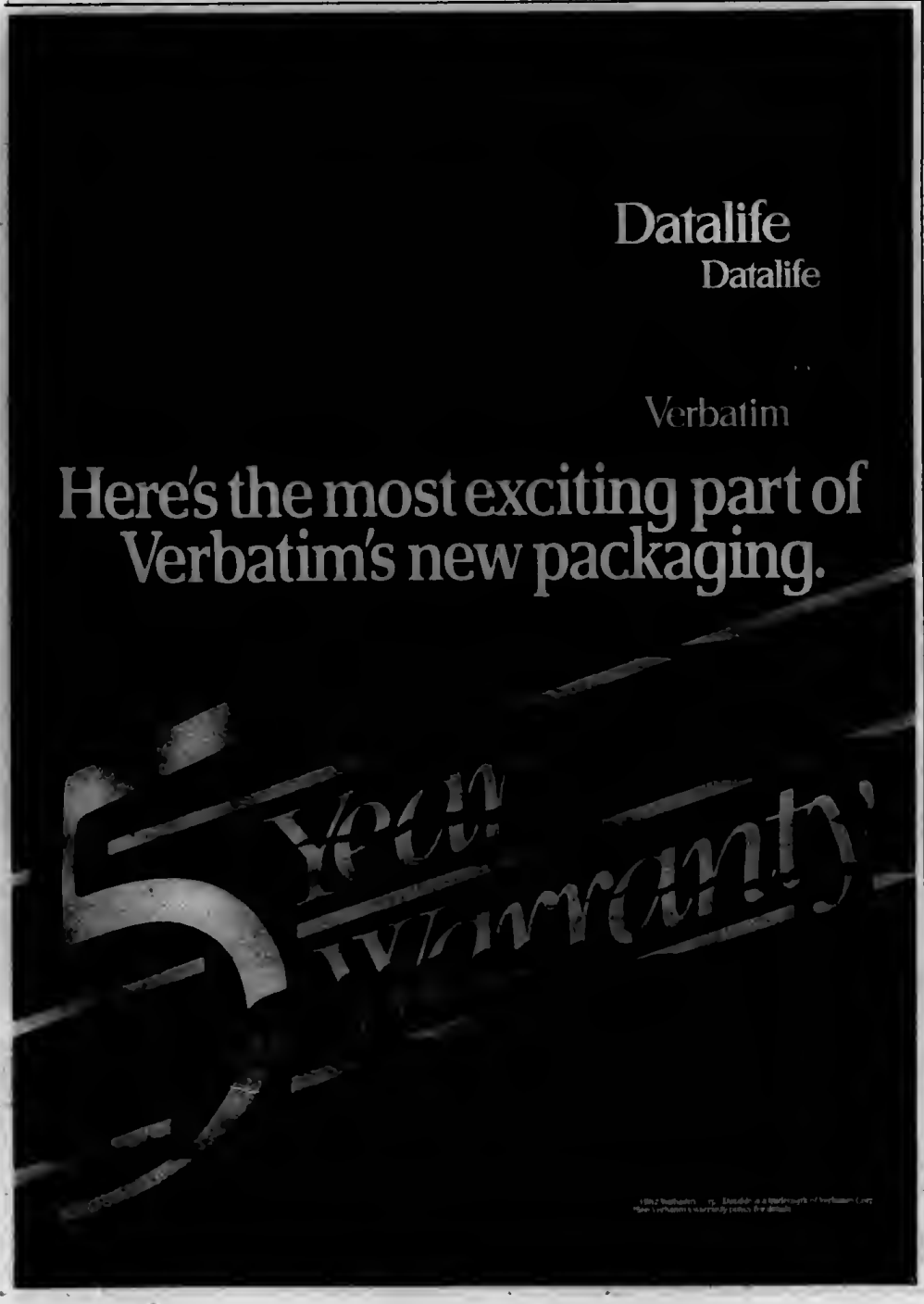
Trilogy Ltd. of Bermuda, on the other hand, is making plans to assemble the supercomputers in Dublin, Ireland, no doubt eyeing the tax and export benefits of the European Economic Community, to which Ireland belongs.

This is important also because CII-Honeywell Bull has an option to obtain licensing of Trilogy VLSI products in France for its non-IBM-compatible computers.

What's more, the U.S. Honeywell, Inc. holds sublicensing rights with CII-Honeywell Bull for the same technology, and apparently both CII-Honeywell Bull and Honeywell may also acquire the IBM-compatible technology from Trilogy if they decide to do so in the future.

An all-out attack on the next generation of IBM's supercomputer product line in the mid-'80s is clearly in preparation. IBM presently controls 80% of the large-scale computer market's global market, but Amdahl Corp.'s 470 systems has given it a run for its money by capturing 15% of the market. Fujitsu and Hitachi are the only other real competitors.

Now Trilogy appears to be competing with Amdahl itself and the Japanese Fujitsu-Hitachi combine in this market. The connection with France and Honeywell may be an ominous sign of the times in which the West is joining forces not so much against IBM, but against Japan, Inc.



Points to Print Publishing

Civiletti Favors Minimal Controls on Videotex

By Brad Schultz
CW New York Bureau

NEW YORK — Former U.S. Attorney General Benjamin Civiletti told a recent conference here that government controls on electronic publishing and videotex should be kept about as minimal as those on print publishing, rather than as extensive as those on broadcasting.

"Government has no need to act as a surrogate protector," Civiletti declared with regard to marketing of information that is transmitted from the supplier's computer to the consumer's terminal.

Joining the former Carter administration official in a session of the Videotex '82 conference, Commissioner Anne Jones of the Federal Communications Commission (FCC) said that the FCC's role in videotex standards-making will be "very limited." Jones indicated that Congress probably will not — before this November's elections — pass legislation that would specify the extent to which the federal government may regulate computing-intensive areas of telecommunications such as videotex and electronic publishing.

Until Congress does, the FCC must comply with the 1934 Communications Act, which established the commission as a regulator of telephones and telegraphy.

Key Issues to Address

Civiletti, who is now an attorney in private practice, said the key issues videotex-related laws would address include: "Who's liable for what?" "How hard can 'soft porn' be?" and the security aspect of on-line information services. Regarding liability, jurists should distinguish between secondary electronic publishers — companies in the business of delivering, but not originating, computer-stored information — and originators of the information, he said, explaining that liability rests with whoever controls the content of the marketed information.

As for pornography, Civiletti noted that existing videotex terminals generally cannot display erotic pictures vivid enough to meet the Supreme Court's conclusion that pornographic material incites prurient interest, depicts sexual conduct and lacks artistic, educational or scientific value. However, substantial progress in graphics technology can be expected. Asserting that "some regulation (of electronic media) is necessary to strike a balance between competing values," the former attorney general said he would endorse enforcement of the following rules:

- A service that pipes political propaganda into the homes of subscribers should be available to those interested in presenting opposite viewpoints.
- The sponsor of any advertisement carried by electronic media should be identified.
- Liability for information sent through electronic media that "defames" an individual should be made clear to the individual.
- Subject to the Supreme Court's interpretation of the U.S. Constitution, local statutes banning publication of pornographic and obscene materials should apply to electronic media.

Videotex suppliers and electronic publishers may find themselves subjected to regulations drafted as controls on broadcasters, Civiletti warned. But regulators and legislators should view electronic media as similar to print publications because consumption of either form of information distribution normally entails deliberate consumer participation. A country that values freedom of choice, in other words, should impose minimal constraints on companies that supply what people freely choose to consume.

According to the FCC's Jones, teletext — one-way transmission of information — has been subjected to regulation, while viewdata — two-way (interactive) transmission has been deregulated. In the past, teletext terminals have differed from viewdata terminals, she pointed out, but terminals capable of supporting both forms of videotex are beginning to proliferate.

This "convergence" worsens the problem of determining what may be regulated, Jones said, remarking that the FCC may soon be known as the "Federal Convergence Commission." The commissioner related that she was "not sure that the FCC should force convergence" through rulings that create incentive for vendors to market terminals suitable for both teletext and viewdata.

Speaking on the agreement to end the antitrust prosecution of AT&T, which calls on AT&T to divest itself of 24 Bell operating companies, Jones declared "I have not been persuaded that (the divested Bell companies) should not be allowed to provide information (through electronic media)." Critics of the deal — which was announced last January and still awaits approval by federal Judge Harold Greene — have charged that the divested companies could regroup as monopolistic marketers of services such as videotex.

THE COMPLETE LINE OF LINE PRINTERS: 800-243-9054*

Digital Associates offers the widest selection of line printer systems plug-compatible with virtually any minicomputer manufactured. For drum, chaintrain, band, belt or matrix technologies, just call our toll-free number and our experts will help you pick the printer that meets your exact requirements. Digital Associates has 27 different models to choose from so you don't have to settle for second best.

With prices of up to 40% off the minicomputer manufacturer's list, delivery in 30 to 40 days, installation by factory-trained technicians and a nationwide service network, it's easy to see why Digital Associates is the largest independent supplier of minicomputer printer systems.

The Printer Store

Digital Associates Corporation
1039 E. Main Street, Stamford, CT 06902 TWX 710-474-4583
*In Connecticut call (203) 327-9210

THIS PACKAGE MEANS BUSINESS

[illegible]

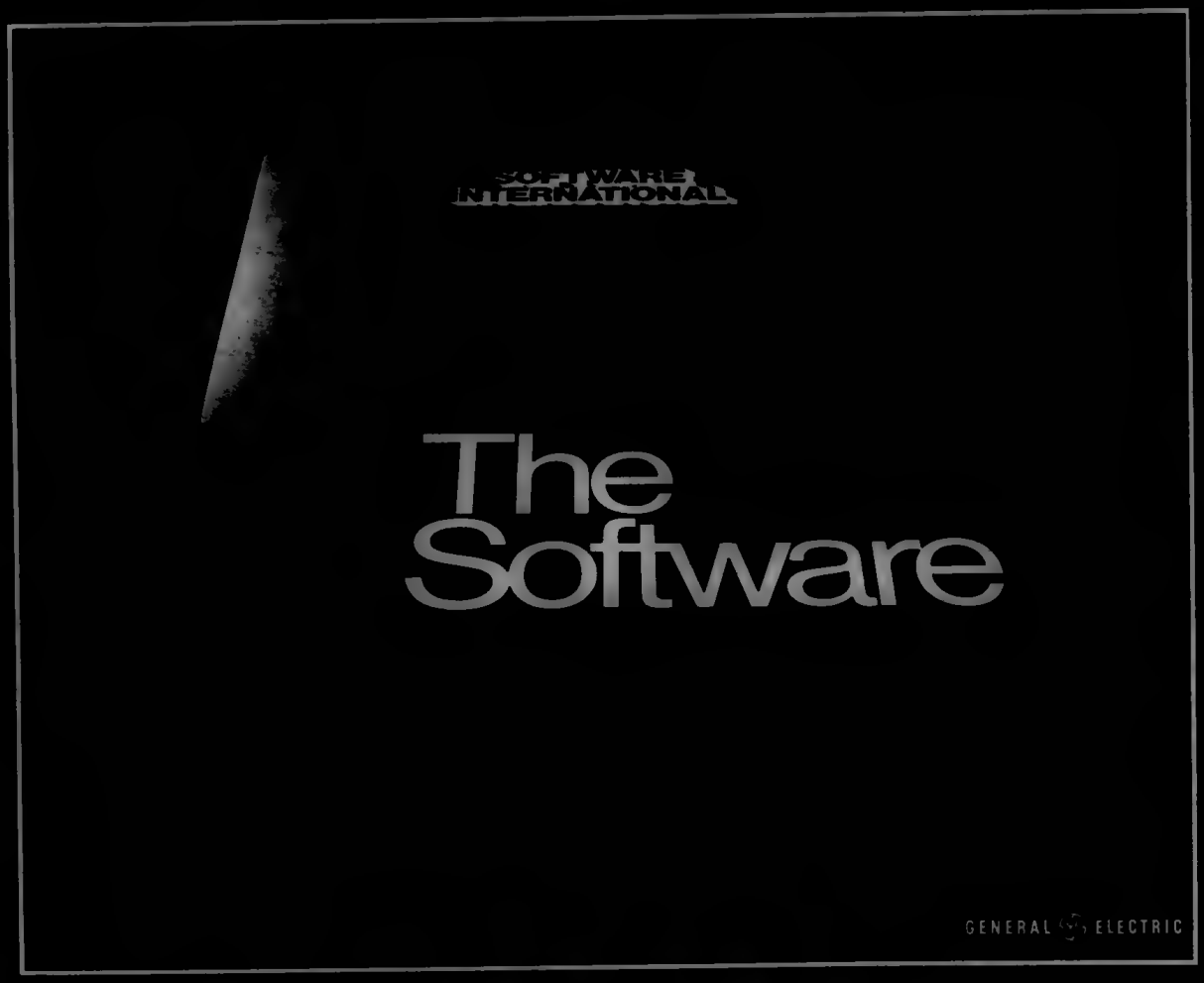
Software International Corporation [illegible] member [illegible] computing and business professionals.

We make information work with a broad range of [illegible] both financial and manufacturing management [illegible] include General Ledger and Financial Reporting, Fiscal [illegible] Modeling and Reporting, Accounts Payable, Accounts Re[illegible] Assets, Payroll, Personnel, Human Resources Management [illegible] Management, Manufacturing Resource Planning and [illegible] Decisive Report Writer.

Put it all together, products, support and people [illegible] SOFTWARE gives you results in every package for total business [illegible]

Call or write Software International Corporation Today.

FOR BUSINESS SOLUTIONS: THE SOFTWARE



SOFTWARE INTERNATIONAL

Elm Square, Andover, MA [illegible]

[illegible] 220 [illegible] enver 303 696 8591 Houston 713) 444 3348
[illegible] 4 866 5728 Toronto (416) 924 1461 Vancouver (604) 669 6122

Gov. Brown Sees Bright Side To Bid to Steal IBM Secrets

By Jeffry Beeler
CW West Coast Bureau

LOS ALTOS, Calif. — Gov. Edmund G. Brown Jr. sees a bright side to the current furor over alleged Japanese efforts to steal IBM trade secrets.

"I think we [in the U. S.] can take pride in the knowledge that we have something that other people want badly enough to try to steal," Brown said. "A lot of other countries don't have anything worth stealing."

The governor pointed to Silicon Valley, where the attempted theft allegedly took place, as indisputable proof that "wealth derives not just from the ground, but also from the products of the human mind."

CW Photo by J. Beeler
Calif. Gov. Jerry Brown

Brown's reaction to the scandal involving Hitachi Ltd., Mitsubishi Electric Corp. and their U. S. subsidiaries came during a July 1 visit to the Silicon Valley headquarters of ASK Computer Systems, Inc. The occasion for his visit was an outdoor reception marking the independent software supplier's first anniversary as a public firm.

Asked if he felt the Japanese had inadvertently paid U.S. technological know-how a backhanded compliment, the governor nodded in assent.

Brown, a candidate for the U.S. Senate, praised Silicon Valley as the "heart" of a worldwide "revolution" in high technology — a status the IBM trade secrets theft case appears to have reaffirmed.

But although he focused primarily on the scandal's positive aspects, Brown stressed the importance of strictly enforcing the laws protecting proprietary corporate information.

He also defended — up to a point — the use of Abscam-like "sting" operations as a weapon for combating crime. "A fine line," he said, separates the appropriate and inappropriate use of undercover investigations, which played a major role in exposing the alleged Japanese theft scheme.

If a sting operation is mounted against a crime already in progress, its use can probably be considered legitimate, Brown said. An undercover investigation becomes questionable only when it is used to initiate some illegal activity.

Supershorts

Timeshared Business Systems of Palo Alto, Calif., which offers services to the transportation industry, has changed its name to Trail Blazer Systems.

— — —

Software Design Associates, Inc. has formed SDA Federal Systems, inc. to provide data processing services to the federal government.

— — —

Software Centres International of Los Angeles (formerly The Software Store) has received approval from the California Department of Corporations to sell franchises, becoming the first software franchise chain in the world, according to a company spokesman.

"Are You Getting IBM Computer Maintenance at a Savings..."

NCM Delivers the same expert maintenance service proformed by IBM engineers using IBM parts and components at a substantial SAVINGS...

WE PROVIDE A COMPLETE PREVENTATIVE MAINTENANCE PROGRAM AND OFFER EXTENDED HOURS OF MAINTENANCE COVERAGE

NCM
NATIONAL COMPUTER MAINTENANCE
SUITE 502/6065 ROSWELL ROAD/P.O. BOX 76787/ATLANTA, GA. 30328
CALL TOLL-FREE 1-800-554-9869 IN GA COLLECT 404-256-9338

DEVELOPING TODAY'S SYSTEMS ASKS A LOT FROM TODAY'S USER.

For years, systems requirements were defined *for* users by analysts who were computer professionals. Although this *seemed* to work, many an unfamiliar system was imposed on an unwilling user. The resulting disasters led many organizations to create project teams where analysts got together *with* the users to define the requirements of the system. This worked so well that requirements definition today is a skill that is expected of every user.

Today's user is expected to (1.) Review the requirements definitions produced by an analysis team (2.) Participate effectively as a member of an analysis team and ultimately (3.) Lead an analysis team. In effect, the user has become an analyst.

Obviously, users need training to meet these new demands. They need a set of tools and techniques to translate their knowledge of a system into a product the implementers can use. Now, YOURDON has a dynamic three-day course oriented to the special needs of the user. "Structured Analysis for Users" covers the following topics. (1.) What is a system? (2.) Overview of Structured Analysis. (3.) Data Flow Diagrams. (4.) The Data Dictionary. (5.) Mini-Specifications. (6.) Determination of system context. (7.) The current physical model. (8.) The logical model. (9.) New requirements. (10.) The new implementation. (11.) Tools, techniques and strategy review.

Developing today's systems asks a lot from the user. "Structured Analysis for Users" is the best method for developing the answers!

Sign me up for "Structured Analysis for Users"
☐ In Chicago, August 18-20.
☐ In San Francisco, September 15-17.
☐ In Toronto, September 22-24.
☐ Send me a detailed course brochure.

Name
Organization Title
Address
City State Zip
Telephone

YOURDON
1133 Ave. of the Americas, New York, NY 10036
Phone (212) 730-2670

Call toll free 800-223-2452. In San Francisco 415-871-2800. In London 01-836-8918

YOURDON

We're talking BASIC here.

BASIC convenience—each of our 3 Sheraton-Tara Hotels is handy to the computer/electronic complexes along Routes 128 and 495. And easily accessible to Boston and Logan Airport. Each features classic Tara Elegance—oversized guest rooms, superb dining, inviting lounges and nightly entertainment. Full health club facilities. And excellent facilities and service for meetings of all sizes.

Making your business travels a pleasure . . . basically, that's what we're all about.

Sheraton-Tara Hotels
THE FLATLEY COMPANY

BRAINTREE, MASS. (617) 848-0500
Route 128 at Exit 8B

FRAMINGHAM, MASS. (617) 879-7200
Mass. Pike at Exit 12, Rte 9 West

NASHUA, N.H. (603) 888-9970
Route 3 to Exit 1 to Tara Blvd.

OR CALL OUR
TOLL-FREE [illegible]
800-325-3535

Object-Oriented 'Smalltalk' Seen 'Dwarfing' Unix, CP/M

(Continued from Page 57)

Even though Smalltalk is intended for microcomputers, "it'a the kind of thing every mainframe company would like to market," Killen said. "Companies like Fujitsu are incredibly interested in developing hardware that would run with something like Smalltalk," he added, suggesting that Xerox would do well to get on with it.

Smalltalk is being heralded as something more complex and versatile than Digital Research, Inc.'a CP/M, boasting features that include multiple windows, high resolution, graphics and more. According to a Strategic report titled "Personal Computer Products and Markets," Smalltalk will take over the 16-bit system market as the new industry standard when it is finally released.

According to Strategic's report, Smalltalk is "an object-oriented language as opposed to procedure-oriented languages such as Basic, Pascal and Fortran." Smalltalk researchers at Xerox'a Parc consider the language a "complete programming or working environment."

Major Advantages

The major advantages of Smalltalk over existing systems appear to be a user-friendly interface, its portability and device independence, Strategic said. Its report claimed that "Smalltalk is completely system-independent, being implemented as a virtual machine. Its only requirements are high-resolution monochrome display, a fairly fast processor and sufficient mass storage . . . Smalltalk has easily the best user interface available."

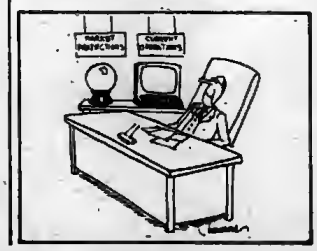
According to a Xerox spokesman, Smalltalk is a by-product of a research project dating back to the mid-1970s, when a group headed by Alan Kay — now Atari, Inc.'s chief scientist — was studying how people learned. Smalltalk was developed as a language that could be used by non-DP types, including children, explained Xerox, and now is thought of as a successful research tool.

Killen said Smalltalk represents a significant investment on Xerox'a part, taking over 100 man-years to develop. He maintained that when Xerox executives realized what they had, they moved back the release date to figure out how to get the most mileage from this "great new technology."

The marketing strategy, Killen theorized, is taking shape now, and Smalltalk will probably come out by the end of the year. When asked if Xerox should be worried about people copying Smalltalk or trying to duplicate something competitive in the meanwhile, Killen said that "It would take at least a year or two to match it."

Smalltalk's license price is also not yet known, but according to Strategic's research, "With declining hardware costs, it will be possible to run full Smalltalk on a $2,000 system in 1990, including display, processor, memory and mass storage."

Xerox declined to comment on the release date or future pricing structure of Smalltalk, but a spokesman did say that it would not be sold on its own. "We're not a software house — we're a systems house . . . Smalltalk will be available in connection with Xerox office systems."



Terminals,
Peripherals, Accessories & Supplies?

We've got'em!

(And we back 'em up.) We'll get 'em on their way to you within 24 hours. At the right price. In time. On time. Every time. And if you have a problem—you have a no problem return with C&TE.

DEC Terminals

VT100	$1,325.00
VT101	995.00
VT102	1,425.00
VT131	1,495.00
VT132	1,500.00
VT103-AA	1,850.00
VT103-BA	2,395.00
VT125	1,995.00
VT18X	2,050.00
LA34-AA	950.00
LA34-DA	925.00
LA34-RA	925.00
LA34-VA	990.00
LA34-WA	1,055.00
LA36-DK	950.00
LA100-RA	1,625.00
LA100-ZA	1,950.00
LA120-AA	1,995.00
LA120-BA	2,075.00
LA120-DA	2,359.00
LA120-RA	1,795.00
LP11-AA	7,500.00
LP11-BA	7,800.00

Call us for pricing at 904/434-1022.

DEC Peripherals

MK11-BE
11/04-DC
ADV11-A
DD11-CK
DH11-AD
DL11-WB
DR11-C
DUP11-DA
FP11-A
FP11-F
H775-CA
KDF11-AA
KEF11-AA
KW11-K
KY11-LB
MS11-MR
Also, RX02, RL01, RL02, RK07 Disk Drives and Controllers IN STOCK. Call us for pricing at 904/434-1022.

FREE GIFT!
Order our catalog and receive a deluxe note pad caddy with three highlight markers. Call 1/800/874-9748. (In Florida, 904/434-1022.)

Accessories & Supplies

DEC RL01K-DC	$145.00
DEC Compatible 4443(RL01K-DC)	$125.00
DEC RL02K-DC	$165.00
DEC Compatible 4443-2(RL02K-DC)	$155.00
DEC RK07K-DC	$400.00
BC03M 25' cable	$ 40.00
BC03M-AO 100' cable	$100.00
DEC RM03-P	$590.00
DEC Compatible 4464-2(RM03-P)	$350.00
DEC RM05-P	$1,350.00
DEC Compatible 4473-2(RM05-P)	$1,250.00
DEC DF03-AA modem	$900.00
DEC VT1XX-ST VT100 stand	$110.00
Dual Density Diskettes	$4.75
Magnetic Tape — 2400' in seal	$18.50

Call us at 1/800-874-9748. (In Florida, 904/434-1022.)

UCC COMPUTER & TERMINAL EXCHANGE

We're The Suppliers. Call us at 904/434-1022.

114 East Gregory Street • Pensacola, Fla. 32501 • Distribution centers in major cities

DEC is a registered trademark of Digital Equipment Corporation.

Emulogic, Inc., a manufacturer of microprocessor development systems, has completed $2.5 million in financing with a venture capital group headed by Seven Rosen Partners of Dallas.

Other investors include Welsh, Carson, Anderson & Stowe, New York; Eastech Associates of Boston; and Massachusetts Capital Resource Co., Boston.

$$$

Cosmos Computer Corp. has completed its inital round of financing, raising $2.5 million in venture capital and $1.8 million in a bank line agreement with Bank of the West, San Jose, Calif.

Venture capital investors include Smith Barney Venture Corp., New York; New Enterprises Associates, San Francisco; Abingworth, Ltd., London; Associated Venture Investors, Menlo Park, Calif.; Genesis, Los Gatos, Calif.; and Robertson, Colman, Stephens & Woodman, San Francisco.

$$$

Vertex Peripherals Corp. has raised $3 million in the first round of equity financing. Three Calif. firms, Technology Venture Investors; Kleiner, Perkins, Caufield & Byers; and Hambrecht & Quist received an undisclosed number of shares in the company in exchange for the capital.

$$$

Pyramid Technology has raised $3 million in venture capital. Investors include CH Partners of Bellevue, Wash.; Crown Advisors, New York; and Vanguard Associates of Menlo Park, Calif.

$$$

Micro General Corp. will sell 775,000 shares of convertible preferred stock at $1 per share, convertible anytime within five years to common stock at 50 cents per share, to obtain venture capital financing.

The sale is subject to shareholder approval at this month's annual meeting. Purchasers include Oxford Venture Fund of Stamford, Conn.; Innoven of Saddle Brook, N.J., and a limited number of private investors.

$$$

Management Science America, Inc. announced a public offering 710,000 shares of common stock at $21.25 per share. The company is offering 250,000 shares and 460,000 shares are being sold by certain shareholders.

$$$

Icom, Inc. has sold 500,000 shares of convertible perferred stock to Cigna Corp. The shares, which are convertible into common shares, represent 20% of Icom's ownership.

$$$

Thomson-CSF, a French electronics company, has invested another $1.5 million in Fortune Systems Corp. bringing to $20.5 million the total venture capital raised by Fortune in less than a year.

$$$

Miniscribe Corp. of Longmont Colo. has secured a $3 million line of credit with the United Bank of Denver.

$$$

Recession Seen As Affecting DP

(Continued from Page 57)

a result of the recession, she observed.

Peters said that the reduction in independents' fees will probably not continue and that they again will command top dollars. However, she added, their technical skills will have to be excellent.

She maintained that technicians who do actual high-technology implementation are feeling less economic pressure than those who are consulting generalists.

"Critical talents will continue to be the consultant's mainstay for awhile. These special skills and knowledge of applications will nurture the independent," she said.

An area on the permanent hiring side of DP has also been hurt by the recession, according to Peters. Middle and upper management hiring, especially in semitechnical areas is "way off" she said.

Drawing a parallel between the DP industry's employment maturation and the consultant's situation, Peters offered an historical look at how the consultant's value has changed.

Historical Perspective

"During the 1960s the dizzying speed of technological development in DP spawned consulting and consulting firms. Then in the early '70s the economic recession took its toll on the economy and DP growth, putting even skilled DPers out of work," she said.

The mid-to-late '70s brought a slow return to hiring, but the earlier recession left its impact and most of the surviving consultants were in large firms. This was the time when the DP consulting "specialist" emerged and with it the independent consultant.

"Instant corporations of one- and two-man firms with marketable talents were earning $200 to $1,000 a day per person," Peters recalled.

Companies could not hire independents fast enough because of their valuable and timely skills and their "outsider's vantage point" of all DP, she said.

"Consultants, large firms and independents were happy," she affirmed.

What is happening in the early 1980s is similar to what the DP consulting industry experienced in the '70s, according to Peters. She also predicted that the consulting market will again be strong.

FINALLY, AN EXCUSE FOR NOT CALLING MA.

Codex's 5208R high speed modem is fully compatible with any Bell 208A/B type modem. Yet the 5208 offers some important advantages.

First, you can only rent from Bell. You can buy the 5208 outright. For only $1750. And if you should decide to lease from us, you'll build ownership equity.

Second, it offers better functionality by letting you grow from dial to leased line operation. The 5208R incorporates both the 208A and the 208B in the same box. Bell's modem does not.

So when Ma asks why you haven't called, just tell her you're trying to save money. And you'll end up with a great modem.

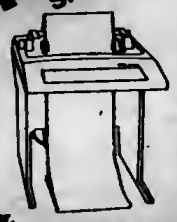
For any data communications problem, turn to Codex. The complete networking company. Call 1-800-821-7700 ext. 890. In Missouri, 1-800-892-7655 ext. 890.

codex

MOTOROLA INC.
Information Systems Group

Codex Corporation, 20 Cabot Blvd., Mansfield, MA 02048/Tel. (617) 364-2000/Telex 94-3402/Codex Benelux Service Operation, Tervuren, A.E. Tel. (02) 767-7700/Codex Europe S.A., Brussels, Belgium Tel. (02) 242-21.31/Codex (U.K.) Ltd., Croydon, England Tel. 01-688-0600/Codex Deutschland, Darmstadt, Bundesrepublik, W. Germany Tel. (06151) 1051/Codex Far East, Tokyo, Japan Tel. (03) 770-6021/IBM Ltd., Toronto, Canada Tel. (416) 749-2171/Offices and distributors in major cities throughout the world. Member of EIA/CMA.

ANOTHER QWIKTERM SPECIAL



LA 36
ONLY $495.
300 BAUD
Dot Matrix
Free Coupler
with Every Order.

•Boston (617) 246-1665
•Chicago (312) 595-7733
•Los Angeles (213) 417-8003
•New York (212) 564-7731
•San Francisco (415) 461-0823
•Wash., D.C. (703) 522-1210

Three Month Leases Available

New Companies

Infographics, Inc. is a firm serving the business graphics market. The firm plans to set up a network of franchise operations to act as service centers for users of its graph production system throughout the U.S. and Canada. It is located at Suite E, 201 Shipyard Way, Newport Beach, Calif. 92663.

Courtney Eagle Associates, Inc. is a data processing consulting firm specializing in the design, development and implementation of software products. The firm is located at 89A Van Wyk Road, Lake Hiawatha, N.J. 07034.

Computer Aided Engineering is a company specializing in the development of computer-aided integrated circuit design systems. Corporate headquarters are in Moffet Industrial Park, 1333 Bordeaux Drive, Sunnyvale, Calif. 94086.

Compuflex, Inc. is a firm whose objectives include teleprocessing payroll, accounts receivable, accounts payable, general ledger, file management and inventory control. Consulting for IBM/34, job costing, accounting systems, statistical management and industrial data bases systems are also available. The firm is located at 12355 Wormer, Detroit, Mich. 48239.

Brokerage Systems Software, Inc. is specializing in software development services and application products for the securities industry. For more information contact Alden Stevens, Suite 1415, 120 Broadway, New York, N.Y. 10271.

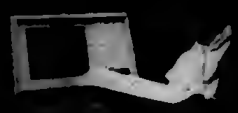
Automated Insurance Rating Services has been formed to market a microcomputer-based automated commercial-lines insurance rating system to the insurance industry. For information contact Warren Bess, Suite 101, 361 Randy Road, Carol Stream, Ill.

Computer Security Placement Service, Inc. is specializing in placing computer security professionals. For information contact Cameron Carey, Department R62, 370 Southwest Cutoff, Northborough, Mass. 01532.

Western Datacom Co. is a joint venture company that will manufacture and market data communications products developed by Western Reserve Communications, Inc. It is based in Suite 900, 5083 Market St., Youngstown, Ohio 44512.

Siecor Corp. has formed **Siecor Fiberlan**, an organization specializing in the development of applications for fiber optics in local-area networks. The firm will be located in Research Triangle, Park, N.C.

"500,000 Real Estate Transactions Just Months After Installation— That's Reality!"



Microdata
We Build Understanding Into Computers

COMPAREX

File comparison utility to compare DATA or TEXT files of any structure or organization including QSAM, ISAM or VSAM. Works on IBM mainframe or plug-compatible under all OS/VS and DOS/VS derivatives. Isolates inserted, deleted and modified records in any file including data bases, program source code, JCL, master files, etc. Performance and support are guaranteed. Demonstration, training and trial installation available.

Sierra Consulting
P. O. BOX 5874
SAN MATEO, CA 94402
(415) 349-6900

Executive Corner

• Kearney-National, Inc. has named four division executives to the position of corporate vice-president. They are: Philip S. Paul, president of Wabash Datatech, Inc.; Ronald W. Keipper, president of Wabash Magnetics Division; John A. Berger, president of International Products & Manufacturing, Inc.; and L. Alan DeRoo, president of Kearney-National (Canada) Ltd.

• Christopher J. Lynch has been appointed executive vice-president of Cosmos Systems, Inc., a subsidiary of CM Technologies, Inc.

• Frank P. Silkman has been appointed vice-president of worldwide field engineering at Data General Corp.

• Richard C. Tippett has been named senior vice-president of operations of Computhink, Inc.

• Mark L. Braunstein has been appointed group vice-president and general manager; John D. James, vice-president for government marketing, and Stephen P. Miller, vice-president for operations and systems development of National Data Corp.'s Health Care Data Services Division.

• Aaron A. White has been elected vice-president, operations services, for Associates Bancorp, Inc., a subsidiary of Associates First Capital Corp.

• Gilbert B. Sheperd has been appointed vice-president of marketing and William J. Dobbin has been appointed vice-president of finance and administration for Cynthia Peripherals Corp.

• Stan Morgenstein has been appointed to the new position of vice-president of marketing at Inslaw, Inc.

• Richard R. Douglas has been appointed group vice-president, I.S. Marketing and Services Group, at Honeywell, Inc.

• Paul M. Vargo has joined Apache Electronic Systems, Inc. as vice-president, legal.

• Rene H. Caron has been appointed vice-president of sales for Eeco Computer, Inc.

• Robert Hazzard has been appointed vice-president of Star Micronics, Inc.'a newly formed Computer Peripherals Division.

• Roger P. Neilsen has been appointed to the new position of vice-president of marketing and sales at Raster Technologies, Inc.

• William G. Webster Jr. has been elected president and James H. Hart has been named executive vice-president of Star Computer Systems, Inc.

• James C. Towne has been named president and chief operating officer at Microsoft Corp.

• Everett T. Bahre, chairman and chief executive officer of Computer & Communications Technology Corp. (CCT) has assumed the post of president of Data Peripherals, a subsidiary of CCT, following the resignation of John F. Kevill.

• Paul J. Davies has been elected chairman of the board at Point 4 Data Corp. Geza Gorgenyi will continue as chief operating officer for the firm.

• James C. Castle has joined Memorex Corp. as executive vice-president/U.S. equipment.

• Vern H. Hart has been named vice-president, North American field service, at Microdata Corp.

• Avery Dee has been promoted to the new post of vice-president of corporate planning for Corvus Systems, Inc.

• Barnell Albers has been named executive vice-president and Terence D. Jung has been promoted to senior vice-president for finance at Tres Computer Systems, Inc.

• Jack W. Simpson has been appointed president of Mead Corp.'s Data Central Division.

• John Holton has been appointed vice-president of marketing planning and Jack F. Thompson has been appointed vice-president of marketing operations in the Business Machines Group of Burroughs Corp.

• Louis J. Finnegan has been named vice-president of North American sales for Xylogics, Inc.

• Richard F. Suitor has been promoted to vice-president at Software Resources, Inc.

• Paul L. Klein has been appointed president and chief executive officer of The Braegan Co.

• Norman J. Nichol has been appointed president and chief executive officer of A.B. Dick Co.

• E.C. Jensen Jr. has been named president of Jack Henry & Associates.

• Francios Olibet has been named president of Videodial, Inc., the U.S. subsidiary of Telesystemes, a French videotex services company.

• Donald R. Landgraf has been promoted to president of List Processing Co., Inc.

• James M. Eckhart has been named president and chief operating officer of Prentice Corp.

• George V. Grune, a vice-president and director of The Reader's Digest Association, Inc. has assumed the post of chief executive officer of Source Telecomputing Corp. (STC). Bettie Alexander Steiger has been named vice-president of corporate relations and special assistant to Grune at STC.

• Angela Nanni has been promoted to the post of vice-president of Informatic General Corp.'s Professional Services Operations/East.

• Louise E. Hechtman Rehling has been appointed vice-president of research, development and technical services at SPSS, Inc.

• Robert M. Parent has been named vice-president of field technical operations for Honeywell, Inc.'a Information Systems Division. David R. Bergerson and John P. Karalis have been appointed vice-presidents and assistant general counsels and Laurence J. Marhoefer has been appointed vice-president and corporate patent counsel at Honeywell.

• Victor Weisenbloom was named corporate vice-president and general manager of Lundy Electronic and Systems, Inc.'a Computer Graphics.

• Edward H. Currie has been elected vice-president and chief operating officer of Lifeboat Associates.

• Joseph J. Mikelonis has joined Halcyon Communications, Inc. as vice-president of finance and administration.

• Kenneth D. Morgan has been appointed vice-president, development, for McGraw Hill Information Systems Co.,

• Terry Clark has been appointed vice-president of strategic and business planning for Inmac Corp.

• Lewis A. Bergins has joined Microcom, Inc. as vice-president of operations.

• Steven J. Puchkoff has been appointed vice-president, sales, for Concord Data Systems, Inc.

PDP-11 & VAX users...

ComDesign's TC-3 Concentrates Multiple Terminals Over One Phone Line . . . Without a DZ11!

- COST SAVINGS TO 90% — Totally eliminates DZ11s, extra modems and phone lines
- STATISTICAL MULTIPLEXING — Up to eight 9600 bps terminals over 1 phone line
- ERROR CORRECTION — Phone line errors eliminated automatically.
- PROVEN RELIABILITY — Over 3 years MTBF
- FAST ECHO RESPONSE
- CONCENTRATION — Multiple terminals—one line
- COMPLETELY TRANSPARENT — No software changes needed
- BUILT-IN SYSTEM MONITORS — Real-time data and signal displays, statistics and error counters
- POWERFUL DIAGNOSTIC PANEL — Modem loop-back, unit self-tests, and terminal diagnostics

Only $840/mo. for a TC-3 . . . Connect 8 Terminals on 1 Phone Line, Without a DZ11.

For further information and the sales office for your area call toll-free (800) 235-6935 or in California (805) 964-9852

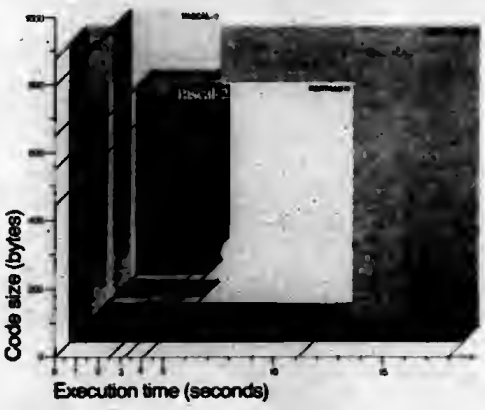
ComDesign

ComDesign, Inc.
751 South Kellogg Avenue
Goleta, California 93117

* Registered Trademarks of DEC

Pascal-2®

PDP-11 RSX, RSTS/E, RT-11 and TSX-Plus



Quicksort benchmark executed on a PDP-11/45.

The Pascal-2 system consists of an optimizing compiler, a high-level debugger and other utilities.

Write us for benchmark details.

Oregon Software

The Pioneer in Performance Pascal

2340 S.W. Canyon Road
Portland, Oregon 97201
(503) 226-7760
TWX: 910-464-4779

FORTRAN IV-PLUS, BASIC-PLUS-2, PDP, VAX, RSX, RSTS/E and RT-11 are trademarks of Digital Equipment Corporation. TSX-Plus is a trademark of S&H Computer Systems.

SNA/SDLC to ASCII
INTERFACED WITH PROTOCOL'S
1067 & 1076 CONVERTERS
Finally!...TSO dial in support from inexpensive ASCII terminals and printers!

Full screen support on CICS, IMS, NCCF, NPDA. Direct or dial in from anywhere in the world at any time. All from a portable ASCII device or microcomputer. Call Newcorp Products now, toll free, for a hardware solution to your protocol problems!

SALES • RENTALS • SERVICE

Call 800-345-8278

In Pennsylvania (215) 485-8180
in Canada (416) 494-3600

Newcorp Products, Inc. is the authorized U.S. and Canadian service center for Protocol Computers, Inc.

Newcorp Products, Inc.
45 Commerce Drive • Aston, PA 19014

Orders & Installations

STS, Inc. has installed its convention bureau housing service and information system for the Salt Lake Valley Convention and Visitors Bureau. The system, which runs on an IBM System/34, is capable of handling more than 20,000 conventioneers at over 40 hotels simultaneously.

M/A COM, Inc. will provide complete satellite earth station systems including site surveys, installation and servicing for a nationwide satellite network for the Catholic Telecommunications Network of America. The value of the contract was not disclosed.

Computer Sciences Corp. has received a $30.8 million extension of its contract to provide support services to the National Aeronautics and Space Administration at Kennedy Space Center, Fla. The seven-month extension includes options for two additional months at an additional $9.4 million.

Informatics General Corp. has been awarded a two-year contract by the National Institute of Alcohol Abuse and Alcoholism for the continued operation of the National Clearinghouse for Alcohol Information in Rockville, Md. The contract is valued at $4 million.

The Houston Oilers and the Cleveland Browns have ordered MDS Qantel, Inc.'s Sport-Pac software to handle their ticketing, general accounting, scouting, player personnel profiles and game analysis functions.

Sentry Data, Inc. has signed a contract with Memorial Beach Hospital, Long Beach, Calif., to provide its full Financial System to the 998-bed medical center.

Avco Computer Services will provide Standard & Poor's Corp.'s Trendline Division with computer graphics services under the terms of a new, long-term contract.

Burroughs Corp. has been selected by the Society for Worldwide Interbank Financial Telecommunication S.A. (Swift) as the principal supplier of computer equipment for a new, second-generation system for international banking transactions. Swift is headquartered in Brussels, Belguim.

Icot Corp. has signed an agreement with the Chase Manhattan Bank to provide equipment for the bank's data communications network over the next several years.

Cablenet of Chicago has chosen LDM, Inc.'s subscription accounting system and a Burroughs Corp. B5900 computer for its in-house business management system.

MSI Data Corp. announced a chain-wide sale of hand-held portable data entry computer systems to Eckerd Drug Co. of Clearwater Fla. Eckerd, a division of Jack Eckerd Corp., has more than 1,200 stores in 16 states.

Computer Language Research, Inc., a firm specializing in computer services and computerized tax returns, has added the Intertel 90/10 system to monitor all date communications lines between the company and its clients worldwide.

Dataproducts New England, Inc. has received an additional $1.5 million under an existing $4.5 million contract from Southern Bell Telephone Co. for network management and control systems.

Siecor Corp. has signed a contract with Citibank of New York for the supply and installation of 10 kilometers of fiber-optic cable that will connect five major locations. The value of the contract was not disclosed.

position announcements | position announcements | position announcements | position announcements | position announcements

POSITION ANNOUNCEMENTS

Systems Programmer

Pacific Northwest

Work with one of today's most dynamic, diverse Telecommunications operations in the country...PACIFIC TELECOM, INC., where our expanding facility in VANCOUVER gives you room to grow!

Duties will include installing, maintaining, altering, tuning IBM computer operating systems and service programs. You will be called upon to support applications development personnel.

At least 3 years experience as an MVS Systems Programmer is desirable; 2 years experience in IDMS maintenance & tuning is a must.

This is a challenging opportunity in a large IBM oriented shop. Outstanding salaries and benefits. For immediate consideration, please send your resume, in confidence, to:
Robert Kemp, Manager Industrial Relations, Pacific Telecom, Inc., P.O. Box C-614, Vancouver, WA 98666-0614. (206) 696-0663. We are an equal opportunity employer. Individuals only apply.

Pacific Telecom, Inc.

(formerly Telephone Utilities, Inc.)

DATA PROCESSING PROFESSIONALS

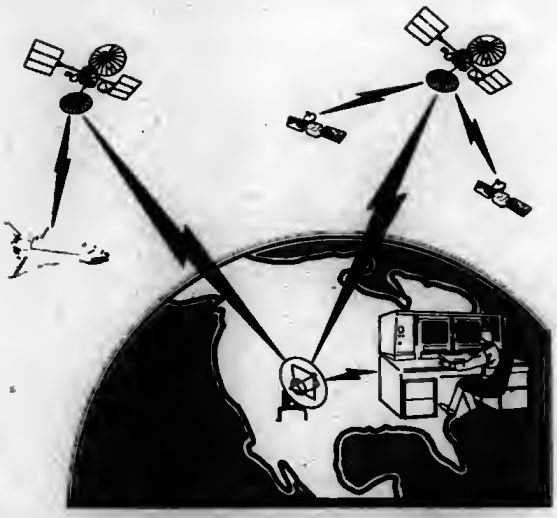
DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader to quality Contract Programming and Consulting. Our continued growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.

We are currently seeking individuals with at least 3 years of diversified programming experience, strong technical backgrounds, and who possess the desire to work in various, stimulating Data Processing environments. IMS and CICS skills are of special interest, as are the abilities to travel or relocate.

We can offer you competitive salaries and comprehensive benefits programs, including bonuses and profit sharing. If you've been searching for a growth opportunity with a dynamic and progressive company with a Management team that "puts people first," then DRC is your answer.

For immediate consideration, please call BECKY FINLEY COLLECT at (404) 633-6387, or send your resume to:

DRC DATA RESOURCE CORPORATION
1040 Tulle Cir. N.E.
Suite 110
Atlanta, GA 30329
An EOE M/F



VARIAN 77/603 SOFTWARE ENGINEERS

Computer Sciences Corporation has earned the distinction as the world's largest information services company by providing the most technically advanced software systems to our many NASA clients, and recognizing the abilities and achievements of our employees. Now is the time for YOU to become a major participant in such an environment.

The System Sciences Division's Spaceflight Tracking and Data Network/Network Control Center program, located in Greenbelt Maryland, a suburb of the Washington D.C. metropolitan area, is actively seeking software/systems oriented individuals to participate in the development of a large-scale real-time system. This system includes executive, data base, diagnostic and applications software. This network is needed to satisfy the high availability and processing requirements associated with NASA Ground Terminal System (NGT), Network Control Center (NCC) and the Tracking and Data Relay Satellite System (TDRSS). Software engineers will provide technical direction throughout the development effort, assist in the installation of the new software and monitor its performance.

These challenging positions provide the opportunity to work in a creative and interdisciplinary environment where current system and software engineering methodologies are being aggressively applied.

The key technical experience requirements are:

- V77 Operating Systems (VORTEX-II)
- Real-Time Communications Experience
- Systems Programming in Assembly Language

Successful candidates will possess a software and/or systems engineering background, have a strong interest in these technical issues, and possess effective writing and speaking skills. A Bachelor's degree in Computer Science, Engineering, Mathematics, or Physical Sciences is a requirement, with an advanced degree desirable.

U.S. CITIZENSHIP IS REQUIRED.

Computer Sciences Corporation offers competitive salaries, and an excellent benefits and relocation program. Interested candidates are invited to send their resume to: Ms. S. Wagner, Staffing Department CW-415, or call Toll-Free: 800-638-0842.

CSC
SYSTEM SCIENCES DIVISION
8728 Colesville Rd.
Silver Spring, MD 20910
An Equal Opportunity Employer M/F/H

SYSTEMS ANALYST

You can enjoy career success in the Pacific Northwest.

Have the mountains at your back, the surf at your feet and all the opportunity you can handle with this Seattle-based industry leader. If you've got a minimum seven years in a manufacturing environment, programming experience in BASIC, and the ability to communicate at all levels, a challenging career in the unspoiled Pacific Northwest may be yours. Top salary, complete benefits package, unequalled opportunity, and immediate opening. Interested? Reply today with resume and salary history to:

CW-A3287, Computerworld, Box 880,
Framingham, MA 01701

EDP OPPORTUNITIES

PROJECT MGR, Money transfer, Clcs, PL1/I, Devlp, enhance....Staff 15.....$51M
DATA Center Design & Installation, Major IBM Degree Design.....$51M
SYSTEMS Engineer CAD Computer aided design PL/I, Fortran, Cobol, install.....$46M
SR S/A DDA, install, savings, maj development data base.....$47M
OS COBOL Programs learn I.M.S. degree This maj corp will tm you I.M.S.....$31M
PL/I Conn Locations, Fin'l applications interactive med sized co.....$31M+

Call Bill Berrelli (212) 349-3010
WM HARRIS ASSOC.
25 Ann Street agency NY, NY 10038

COMMUNICATIONS GROUP:

DATA/VOICE COMM.
NETWORK PLANNING
NETWORK DESIGN
ACF/NCP SOFTWARE, etc...

E.D.P. GROUP:

SYSTEMS PROG.
in MVS, CICS, IMS
DATA BASE ADMIN.
APPLICATIONS

SPECIALIZED DIVISIONS REPRESENTING EXCELLENT OPPORTUNITIES "NATIONWIDE"

call or write: 714-851-0311

o-r-t-u-n-e PERSONNEL CONSULTANTS
19742 MacArthur Blvd., Irvine, Ca. 92715

How Do Computer Salaries Stack Up in Different Cities Across North America?

Have you ever wondered how your salary compares with your peers in your own local area? Whether computer professionals are making substantially more or less money elsewhere? Or whether all markets throughout North America are experiencing salary increases—or decreases—as the economy fluctuates up and down?

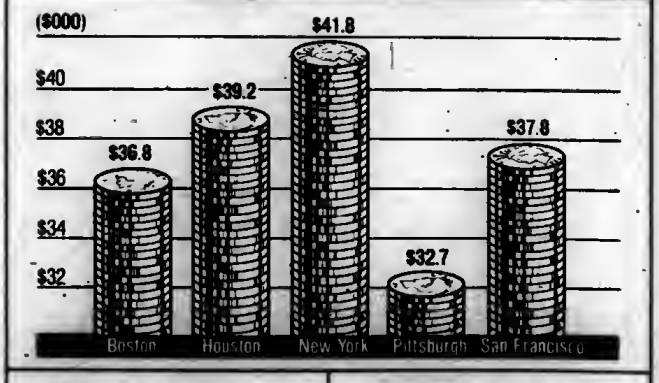
Our new report, the most complete Local Survey we've ever published, can show you exactly what others are earning in most major cities throughout the United States and in Canada. It's based on an in-depth analysis of our diverse client base as well as the thousands of computer professionals we are in contact with every month.

We Surveyed 48 Specific Position Categories in 48 Markets.

In addition to reviewing *national* medians, the Local Survey breaks out salary data by market. Forty-eight specific positions are reviewed in each city. Included are position categories in programming, software, systems design, data communications, mini/micro systems, data base, EDP auditing, computer marketing, management and others—at various levels of experience and at different size computer system sites.

That means, for example, a Minicomputer Programmer with two-to-four years of experience will be able to determine what his/her peers make in cities ranging from Albuquerque to Vancouver or Akron to San Diego.

For example, if you're a Data Communications Programmer with over four years of experience, here's how your salary stacks up in just five of forty-five markets surveyed.



Altogether, salaries in forty-five markets are reviewed.

The New Local Metropolitan Computer Salary Survey Can Show You. It's FREE!

keeping pace—or where your career might head in the future—our report is must reading. Especially in today's competitive environment where smart planning is key to long-term success.

This report will let you know where you stand with your peers today and what you might expect to earn as you move up in the profession in the future. This information is important to you considering today's cost of living and the need to watch your career plans and financial situation more carefully than ever.

And because no other Survey available is based on more contacts with the firms that are hiring and with the people who are getting hired, you can depend on the data presented.

Call for Your Free Copy. Today.

The Survey is available free to computer professionals without charge. Call the Source Edp office nearest you and request a copy. As you'll discover, the Survey can be an extremely valuable asset in helping you make important career decisions.

source edp

Offices nationwide.
Client organizations assume our charges.

It's a Most Valuable Tool for Mapping Out Sound Career Plans.

The new, *Local Metropolitan Computer Salary Survey* is compiled and published by Source Edp, the Nation's oldest and largest recruiting firm devoted exclusively to the computer profession.

If you're wondering whether your salary is

This handy, fold-out Survey breaks out salary information by market and by position category. 2,160 separate figures are reported, which makes this Survey the most extensive one ever undertaken by Source Edp.

Call Today for Your FREE Copy.

Call the Source Edp office nearest you for your free copy today. If unable to call, please write:
Source Edp,
Dept. CL-1
Two Northfield Plaza,
Suite 227
Northfield,
Illinois 60093

United States:

Arizona
Phoenix 602/279-1010

California
Northern
Mountain View 415/969-4910
San Francisco 415/434-2410
Walnut Creek 415/945-1910
Southern
Century City 213/203-8111
Fullerton 714/871-6500
Irvine 714/833-1730
Los Angeles 213/688-0041
San Diego 714/231-1900
Torrance 213/540-7500
Van Nuys 213/781-4800

Colorado
Denver 303/571-4450
Englewood 303/773-3700

Connecticut
Hartford 203/522-6590
Stratford 203/375-7240

District of Columbia
Washington D.C. 202/466-5890

Florida
Miami 305/624-3536

Georgia
Atlanta
Downtown 404/586-9350
North 404/953-0200
Northeast 404/325-8370

Illinois
Chicago 312/782-0857
Northfield 312/441-5200
Oak Brook 312/986-0422
Rolling Meadows 312/392-0244

Indiana
Indianapolis 317/631-2900

Kansas
Overland Park 913/888-8885

Kentucky
Louisville 502/581-9900

Louisiana
New Orleans 504/561-6000

Maryland
Baltimore 301/727-4050
Rockville 301/258-8800
Towson 301/321-7044

Massachusetts
Boston 617/482-7613
Burlington 617/273-5160
Wellesley 617/237-3120

Michigan
Detroit 313/259-7807
Southfield 313/352-6520
Troy 313/362-0070

Minnesota
Minneapolis
Downtown 612/332-6460
West 612/544-3600
St. Paul 612/227-6100

Missouri
Clayton 314/862-3800
Kansas City 816/474-3393
St. Louis 314/231-4880

New Hampshire
Nashua 603/880-4047

New Jersey
Cherry Hill 609/482-2600
Edison 201/494-2800
Morristown 201/267-3222
Paramus 201/845-3900
Princeton 609/452-7277

New York
New York City
Grand Cent. Sta. 212/557-8611
Penn Station 212/736-7445
Wall Street 212/962-8000
Rochester 716/263-2670
Syosset, L.I. 516/364-0900
White Plains 914/683-9300

Ohio
Akron 216/535-1150
Cincinnati 513/769-5080
Cleveland 216/771-2070
Columbus 614/224-0800
Dayton 513/461-4880

Oklahoma
Tulsa 918/585-7700

Oregon
Portland 503/223-6180

Pennsylvania
King of Prussia 215/265-7250
Philadelphia 215/665-1717
Pittsburgh 412/261-6540
Wilkins Township 412/247-4400

Texas
Dallas
Central 214/749-1900
North 214/387-1500
Fort Worth 617/338-9300
Houston
Downtown 713/751-0100
N. Loop W. 713/957-8555
S.W. Fwy. 713/626-8705
San Antonio 512/342-9688

Virginia
McLean 703/790-5610

Washington
Bellevue 206/454-5400

Wisconsin
Milwaukee 414/277-0345

Canada:

Ontario
Don Mills 416/425-5730
Mississauga 416/272-3333
Toronto 416/865-1125

Quebec
Montreal 514/849-7043

position announcements | position announcements

"Ætna works for me."

"I've been a systems programmer for five years. I could get a job anywhere. So why did I choose Ætna? Software, for one thing.

"It's as sophisticated and state-of-the-art as I am. TCAM, CICS, DL-I, DMS/OS, IDMS. I'm working on exciting projects. Writing programs I could only dream of in my last job.

"But Ætna's commitment to data processing doesn't stop there. The hardware is top-shelf, too. The training program is teaching me even more than I already know. There are great benefits, including Life, Medical, Dental, and Disability Insurance. And best of all, they pay me what I'm worth.

"Sure, I work for Ætna. But only because Ætna works for me."

If you have 1-5 years' experience, call or send your resume to Mary Scott, (203) 273-3798, Recruiting Office, Ætna Life & Casualty, 980 Asylum Avenue, Hartford, CT 06156. An equal opportunity/affirmative action employer.

Experienced Systems Programmers and Programmer/Analysts wanted now.

Ætna

Programming

Systems Analyst: NCR and Las Vegas – A winning combination

Serve as the vital technical link between our sales representatives and our customers. The stimulating work you do in support of our sales will take you out of the office. You'll find:

- Varied software applications for a range of users.
- Hardware which is among the world's largest and most sophisticated.
- Involvement from developing sales proposals through post-sale consultation.
- An exciting city to live in.
- No state income tax.
- Promotion from within

To qualify as a Systems Analyst, you must have a working knowledge of COBOL 74 and 2-5 years of experience in the design, debugging, installation, application and maintenance of large systems. You must also have a BS Degree in Computer Science or Business, or equivalent experience. Ideally you will be already located in the Las Vegas area or able to relocate on short notice.

Earn NCR Corporation's winning combination of competitive salary, excellent benefits, and recognition for your achievements. Call collect for an immediate interview or send your resume to: Dept. J55, Mr. Steve Jacobs, NCR Corporation, P.O. Box 24000, Los Angeles, CA 90024, (213) 566-5228.

NCR
Complete Computer Systems
Equal Opportunity Employer

SYSTEMS CONSULTANT

The Allentown & Sacred Heart Computer Center, a data processing cooperative providing a comprehensive information resource to hospitals of the Lehigh Valley, is seeking candidates for the newly created position of Systems Consultant.

This individual will share applied skills and integrate new technologies to support a rapidly expanding multi-vendor hardware and software environment. Applicants should have 7-10 years experience, with an in-depth knowledge of IBM compatible hardware and software in the areas of Systems Programming, Data Base, and Data Communications Technologies.

Principals only, send resume, salary history, and requirements in confidence to:

Stephen B. Keith
Manager of Technical Services
Allentown & Sacred Heart Computer Center
2200 Hamilton Street
Allentown, PA 18104

EDP OPPORTUNITIES COAST TO COAST

Robert Half, staffed by EDP professionals for EDP professionals with 60 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets. All fees are paid by client companies, of course. The following is a partial listing of opportunities and locations:

ALBUQUERQUE

IBM

Expanding shop converting to 4331. Requires design & implementation exp. and hardware/software evaluation exp. Start $30,000

SYS 34

Small but expanding shop seeks DP Manager System 34 in RPG II. Financial applications. Start $28,000

Dick Stevens
ROBERT HALF
of New Mexico
P.O. Box 3320
Albuquerque, NM 87190
(505) 884-4567

WEST PALM BEACH

MANAGER TECHNICAL SUPPORT

Has your career come to a standstill? Excellent South Florida company seeks a technical pro with a solid experience in network design and analysis. Additional responsibilities would be to direct a technical support group in voice and data communications. Financial background a +. Excellent benefits and relocation package. Fee Paid. Salary to $34,000

Josh Sabatch
ROBERT HALF
of Ft. Lauderdale, Inc
7770 W. Oakland Park Blvd.
Suite 410
Ft. Lauderdale, FL 33321
(305) 742-0200

DAYTON

EDPeople

I nnovative.....
M anufacturing.....
S tate of the Art.....
...describes this local company. Several career opportunities are available to the skilled DP'er...

DATA BASE ADMIN

3 yrs IMS DB/DC $33-37,000

LEAD PROGRAMMER

COBOL, IMS, data dictionary, structured techniques, fin'l apps. $32-38,000

LEAD B/R SYS ANALYST

5-10 yrs DP exp. 4+ design, IMS biggd, P/R, personnel, fin'l, structured design. $30-34,000

IMS PROG/ANALYSTS

2-3 yrs exp, COBOL, order processing + structured techniques. $23-30,000

MPG PROG/ANALYST

2 yrs COBOL, MRP + +, APICS + IMS — the key to your future Fee Paid. $15-20,000

Susan Robinson
Jim Lee
ROBERT HALF
of Dayton, Inc.
First National Plaza
Dayton, OH 45402
(513) 224-0939

SOUTHERN CALIFORNIA LOS ANGELES

SYSTEMS PROGRAMMERS

Multiple openings provide flexibility, alternatives and excellent career growth.

MVS to $45,000 +
VSE to $40,000 +
VM to $40,000 +
VSAM to $40,000

Joe Reese
ROBERT HALF
of Los Angeles, Inc.
3699 Wilshire, #1000
Los Angeles, CA 90010
(213) 386-6805

COMMERCE

SENIOR SYSTEMS PROGRAMMER

Great Opportunity in Orange County with fast growth DP oriented Co. Data Base Systems experience required and CICS integrate a plus. Fee Paid To $35,000

Lynn King
ROBERT HALF
of Commerce
6232 E. Telegraph Rd.
Commerce, CA 90040
(213) 721-2197

ORANGE COUNTY

CAD/CAM OR SCIENTIFIC PROGRAMMERS

Work in sunny Southern California for a large high tech Co. The work environment & computer hardware are first class. Your potential for growth is almost unlimited. To qualify, you should have a solid background combining education (preferably engineering or scientific) and work experience in graphics, engineering support and/or CAD/CAM Applications in FORTRAN. Salary to $35,000

Al Handler
ROBERT HALF
of Orange County
3333 N. Broadway, #200
Santa Ana, CA 92706
(714) 835-4193

FORT LAUDERDALE

SYSTEMS AND PROGRAMMING MANAGER

Subsidiary of National Conglomerate, located in Ft Lauderdale, has an open position for Software Manager. Prior COBOL and heavy accounting systems design background are essential. You will supervise a staff of programmers, analysts and designers. Relocation and Fee Paid. Salary to $35,000

Chuck Nell
ROBERT HALF
of Miami, Inc.
2699 Le Jeune Road, #614
Coral Gables, FL 33134
(305) 447-1767

JACKSONVILLE

SYSTEMS PROGRAMMER

Local based corporation seeks an individual with a minimum of 2 years experience as a Systems Programmer. Background must include large scale IBM OS/MVS, CICS environment. Send resume with salary history. Relocation and Fee Paid.

Doug Cook
ROBERT HALF
of Jacksonville, Inc.
3530 Regency Square Blvd.
Suite 213
Jacksonville, FL 32211
(904) 721-0570

KANSAS CITY

JR ANALYST

Trade 2 years of programming experience for the opportunity to be trained to be a systems analyst. State of the art MVS shop seeks a self-starting programmer who wishes to learn the latest state-of-the-art design techniques...Good communication skills and prior coding qualities. Salary to $25,000

MANAGEMENT

Suburban KC manufacturing company converting to System 38 needs an addition to their management staff. Prior DP Management experience & manufacturing systems preferred. Must program in RPG II and like a "shirt-sleeve" environment. Salary to $30,000 + bonus

SYSTEM SUPPORT

Highly technical position requires working experience in IMS support. Must have 3 years plus technical experience on IBM equipment. Cross train on MVS. Suburban KC location with excellent benefits. Salary to $35,000

George Waterman
ROBERT HALF
of Kansas City
127 W. 10th St.
Kansas City, MO 64105
(816) 474-4093

ORLANDO

CONSULTANT

Must 5+ yrs 4300 DOS and CICS for Sr Technical slot Gross Opportunity To $33,000

SYSTEMS PROGRAMMER

Design & Develop Data Reese with high level languages for R&D Center. To $35,000

PROG/ANAL

Min 3 yrs exp with DOS/VSE and COBOL, design exp a must. CICS +. To $25,000

Pam Evans
ROBERT HALF
of Orlando
3000 Lee Road, Suite 415
P.O. Box 17502
Orlando, FL 32860
(305) 628-2636

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by

CIRCULATION DEPARTMENT

COMPUTERWORLD

375 Cochituate Road, Rte. 30
Box 897
Framingham, MA 01701-9985

ROBERT HALF

ATLANTA

SYSTEMS SOFTWARE TECHNICIAN

Minimum of 4 years exp as a systems software technician or specialist. Know MVS, internals, and telecommunications with ability to plan, install, troubleshoot, and maintain MVS, VTAM and NCP. $28-40,000

DATA BASE ANALYST

At least 2 years exp in data base management, to include DL/1, COBOL and DOS. Pluses are CICS, ASSEMBLER, DATA DICTIONARY, HDAM (or HIDAM), and installation experience. $25-28,000

PROGRAMMER/ANALYST

At least 3 years exp with COBOL, BASIC II, RPG II or III, and systems 34 and/or 38. $25,000

Terence White
ROBERT HALF
of Atlanta, Inc.
3379 Peachtree Rd. N.E.
P.O. Box 10201
Atlanta, GA 30319
(404) 266-2153

GREENSBORO

DC SPECIALIST

Expanding co using MVS NCP & 3705's. Should know COBOL, BAL, CICS. Salary to $35,000

DEC PROG/ANAL

Nat'l corp opening new facility. Using PDP/11, RSX-11M & Fortran. Salary to $28,000

BANKING S/A

Prominent SE Bank has oppty for exp Analyst with COBOL & OS. Salary to $32,000

Larry Brooks
ROBERT HALF
of North Carolina, Inc.
Wachovia Bldg., Suite 1117
Greensboro, NC 27401
(919) 274-2448

SEATTLE

PROGRAMMER/ANALYST

IBM OS Assembler Programmer/Analyst with CICS-macro level for corporate head quarters of national firm. Looking for promotable individual. To $33,000

Marjie Peterson
ROBERT HALF
of Seattle, Inc.
600 University Street
Suite 2328
Seattle, WA 98101
(206) 624-9000

WASHINGTON

SAILING

Surburban DC firm has exciting opportunity for an IBM Data Base Administrator. Live on the bay! $32,000

ROBERT HALF
of Washington
7316 Wisconsin Ave.
Suite 401
Washington, DC 20814
(301) 652-1960

NEW ORLEANS

BANKING

Large national Southern fin'l institution has need of programmers due to expansion. Large IBM shop. COBOL & CICS req'd. Exc benefits. To $30,000

FORTRAN

Multi-billion $ energy firm is seeking 2 yrs exp'd System Analyst. FORTRAN & Mini bkgd req'd. To $30,000

ROBERT HALF
of Louisiana, Inc.
4630 One Shell Square
New Orleans, LA 70139
(504) 524-3773

DALLAS

SR SYSTEM ANALYSTS

Need strong knowledge of the banking industry. DDA expertise essential. Requires COBOL programming experience in an IBM DOS or OS Shop. To $32,000

SYSTEM 34/38

Newly created position in Mfg company. Looking for a Systems Analyst with system 34 or 38 background. RPG III also required. To $24,000

John Steiger
ROBERT HALF
of Dallas, Inc.
Two NorthPark East, #750
Dallas, TX 75231
(214) 363-3300

NEW YORK

DATA PROCESSING
Mortgage Origination
Westchester

Internationally recognized & very prestigious investments company has positions available for (3) Sr DP professionals with strong COBOL programming exp & CICS. Heavy programming is involved with these situations. Must have exp in developing Mortgage Origination Systems & thorough knowledge of the Mortgage business. Superior growth oppty exists since this division is nationwide. First (2) months of this project will be located in Dallas, Westchester thereafter. Bonus is based upon timely completion of the project & could double your base salary. Outstanding benefits package. Fee Paid. $50,000 + Bonus

WANG VS COBOL SUPPORT ANALYST

Internationally recognized corp in midtown is offering a challenging career opportunity in their Support Resource Group. 2+ years DP with an expertise in WANG VS systems and programming in COBOL is required. Responsibilities include trouble-shooting, analyzing customer needs and technical support for field engineers. Excellent oral and written skills essential. Superior growth potential with this progressive leader in their field! Fee Paid. $36,000

SYSTEM 34
ALL DEVELOPMENT
HEAVY SYSTEMS DESIGN

Prestigious commercial real est firm has an outstanding senior level position available. The qualified candidate must have 3-4 years Systems 34, RPG II experience with a strong systems analysis background. Responsibilities include incorporating the System 34 into all areas, heavy analysis and user interface with top management. Join this progressive, highly motivated and success oriented organization. Super benefit package. Fee Paid. $36,000

SR PROGRAMMER/ANALYST
TEAM LEADER
OS/COBOL

Prestigious financial institution has a position available for the candidate with 4+ years OS/COBOL experience, strong design skills, some CICS and project life cycle background are required. Brokerage applications knowledge a plus. Responsibilities will include supervising junior staff in a developmental project, as well as interfacing with management level. Strong benefit package. Fee Paid. $35,000

ROBERT HALF
of New York
522 Fifth Avenue
New York, NY 10036
(212) 221-6500

MILWAUKEE

PROJECT MANAGER
MANUFACTURING SYSTEMS

Are you a problem solver? Exceptional company needs someone with several years experience developing manufacturing systems. Company has IBM 4341 DOS/VSE, VM & is installing all IBM COPICS modules. Supervise staff of 2-6. Mid $30's

SR SYSTEMS ANALYST

Are you slowed down and stagnating in yesterday's environment? Get with a company that is rapidly growing and advancing its DP technology. Several years experience as a Systems Analyst could put you in this unique position. $33,000

Dick Bird/Larry Braden
ROBERT HALF
of Wisconsin
777 E. Wisconsin Avenue
Milwaukee, WI 53202
(414) 271-HALF (271-4253)

ST. LOUIS

SR MANAGER/CONSULTANT

Major national consulting firm seeks articulate, self-motivated individual with 10 years experience. Requires Masters degree. Must be familiar with project management in large mainframe shop. CDP a plus. Will start new department. Salary from $45,000

CAD/CAM PROGRAMMER/ANALYSTS

St Louis based consulting firm seeks several programmers familiar with CAD/CAM applications. New department being expanded to twice its size. Initial projects are in RAD mode. Salary to $35,000

DATA BASE ANALYST

Major manufacturing firm, a division of a Fortune 500 firm, seeks a real "Heavyweight" with CICS and/or DL/1. This position will be the final word on CICS and DL/I application development. If you do this now and do not make 30K this is your chance in a high visibility position. Salary to $35,000

Randy Pace
Delores Cook
ROBERT HALF
of St. Louis
7733 Forsyth
St. Louis, MO 63105
(314) 727-1353

MINNEAPOLIS ST. PAUL

SENIOR SYSTEMS ANALYST

Rapid career growth oppty for very sharp Systems Analyst. Direct a professional team in the installation and design of new systems and be promoted into management. Environment is 4331 DOS/CICS. Job #2656. Salary to High $30's

Mark David
or Leah Duncan
ROBERT HALF
of Minneapolis/St. Paul
2236 IDS Center
Minneapolis, MN 55402
(612) 336-8001

TULSA

MVS INTERNALS

Large Oklahoma Oil & Gas company has a super growth opportunity for a MVS Internals Programmer. Must have at least 2 years programming MVS utilities and JES 3 experience. Excellent relocation package. To $40,000

ROBERT HALF
of Oklahoma, Inc.
5840 S. Memorial Dr., #217
Tulsa, OK 74145
(918) 627-1000

BOSTON

HONEYWELL SYS ANALYST

Estab EDP svcs org seeks sharp COBOL P/A for new DMBS projs. Should possess HONEYWELL bkgrd w/on-line devel exp. Full interv & reloc pd + mortgage diff. Attractive suburban loc. Salary $35,000

SR SYS ANALYST

Well-estab $200M mfr seeks tech astute analyst for sys deve projs. IBM 4341 DOS/VSE, COBOL, CICS environ with mfg & fin'l sys. Respon for design thru implem. Country setting. Salary $36,000

MFG PROJ LEADER

$800M consumer goods mfr looking for bus oriented mfg mgr to support plant functions at remote sites. Must have solid bkgrd in BOMP, MRP, invty control, order entry & material control. Corp lvl pos w/hvy trvl. Salary $34,000

Gerry Battista
ROBERT HALF
of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200

PROVIDENCE

IMS DB/DC SPECIALIST

Fortune 500 co desires in-depth IMS DB/DC tech exp from the mfg ind. Perform as indiv contributor for tech projs & grp leadership role & implem of batch & on-line DB apps. Salary range $28,000

Bob Lathrop
ROBERT HALF
of Providence, Inc.
400 Turks Head Building
Providence, RI 02903
(401) 274-8700

PALO ALTO SAN JOSE

SYSTEMS ANALYST

Must have Sys. 34/38 MAPICS. Involved in installation and support at manufacturing and sales facilities in Far East and Europe.

SR PROGRAMMER/ ANALYSTS

HP3000 COBOL. Finance IMAGE, VIEW, QUERY a plus.

COBOL. IMS DB/DC or CICS. Manufacturing, financial or insurance applications.

Linda Strickland
Jim Dupre
ROBERT HALF
of Northern Calif., Inc
2 Palo Alto Sq., Ste. 212
Palo Alto, CA 94304
(415) 493-8700

675 No. First St., Ste. 509
San Jose, CA 95112
(408) 293-9040

TAMPA

P/A TO PROJ LDRS

Major FL financial inst needs banking exp-DDA Loans all types item processing. Solid IBM State-of-Art. To $32,000

SYS PROG

Large IBM Hows DOS, OS or MVS COBOL-SYSGENS Dept expanding CICS/on line/IMS great. $32,000

PROG/ANAL

Multiple openings for IBM/CICS COBOL-Acctg or mfg appl IMS or DL1 great. To $25,000

Stan Allen
ROBERT HALF
of Tampa, Inc.
1311 North Westshore Blvd.
Tampa, FL 33607
(813) 876-4191

HARTFORD

DATA COMM'S

CT clients seeking indiv's with IBM NCP/VTAM sys prog exp. Oppty to expand nation-wide network & also into multi data ctr environ. Microwave/satellite transmission exposure helpful! Salaries to $38,000

FIN'L SYS ANALYST

CT oppty for DP pro with bkgrd in fin'l acctg, investments or invest acctg to devel major fin'l sys. DP proj or analytical bkgrd with an MBA req. Salary to $40,000

SR BUS ANALYST

Outstanding oppty for DP pro with excellent written, verbal & presentation skills to lead DP mkt research activities. Work directly with DP mgmt & product mgmt to determine co's competitive strategy. Mini-micro DB/DC exp qualifies. Salary to $34,000

OS SYSTEMS PROG

Multiple CT oppty's for exp'd sys prog's with MVS, JES 2 or JES 3 internals bkgrd. Multi industrial openings offering a variety of exciting oppty's to fit individual needs. Salaries to $40,000

DOS/VS SYS PROG'S

CT oppty for indiv with DOS internals exp to be respon for all software & future exposure plans. Small co with a highly prof environ. Salary to $37,000

CICS-IMS SR ANALYST

Excellent oppty for sr analysts/prog's with CICS/IMS exp to take charge of new state-of-the art devel projs. Co offers outstanding benefits & multiple career path oppty's. Salary to $35,000

DP DIRECTOR

CT oppty for fast track indiv with IBM IMS CICS on-line bkgrd to take charge of med size DP install. Ideal cand will be proj mgr or asst DP dir earning low mid $30's. Excellent oppty for the right indiv. Salary to $42,000

Stan Durbas
Burt Israel
ROBERT HALF
of Hartford, Inc.
111 Pearl Street
Hartford, CT 06103
(203) 278-1710

BUFFALO

PROJECT ANALYSTS

Lge corp data ctr has openings at several lvls from analyst/prog to proj mgr. Cand must have CICS in an IDMS environ. Banking, financial or acctg apps is best exp. State-of-the-art hardware + prof peer grp enhances these pos. Salary $24-38,000 DOE

Bob Collins
ROBERT HALF
of Buffalo, Inc.
1310 Liberty Bank Building
Buffalo, NY 14202
(716) 842-0801

CHICAGO

SYSTEM ANALYST

Key position with this world-wide GIANT. To qualify you need a solid foundation in distribution and merchandise. Your background should include DOS and BAL. Management presentations lead to visibility! $30,000

Sandy White
ROBERT HALF
of Chicago, Inc.
35 E. Wacker
Chicago, IL 60601
(312) 782-6930

SAN ANTONIO

SYSTEMS ANALYST

Analyst for at least 5 yrs in Cable Television industry. Need to be an analyst on the acctg appls (billing, etc.) not production appls. Expanding growing company with exceptional benefits/earnings potential for the right applicant. $OPEN

FIN-INTERFACE/CORPORATE SYSTEMS

Degree required. 5 plus yrs in DP with at least 2 yrs in user interface role. Will be comm with appls division and field users. Heavy financial bkgd a real plus. Company is expanding, not replacing, and needs one good person for this very important and responsive position. $25,000

SR ANALYST

Degree nice, not required. IBM large system in COBOL a MUST. Converting from 34 to 4341 plus new appls. Job is with high visibility co. Good upward growth. To $36,000

DIR OF BANKING SYSTEMS

Degree required. MBA a +. 10 plus yrs in DP with at least 5 yrs in banking firm. Will direct efforts of Systems/Programming staff. IBM environment, with heavy correspondent banking. Very visible and excellent benefits. Mid $40's

All positions above and many more are in Texas, where "Long Necks", "Armadillos" and the "Cotton Eyed Joe" call home.

Bob Beldauf
ROBERT HALF
of San Antonio, Inc.
6243 I H 10 West, #850
San Antonio, TX 78201
1-800-531-5402
In Texas Dial (512) 736-2467

AUSTIN

DP SUPERVISOR

Degree in related field. Two years experience on System 34 and RPG II. Exposure to MAPICS. $25,000

PROGRAMMER

Excellent opportunity for individual w/CS degree and 3.5 GPA. Two years ALC, OS Environment. Insurance bkgd a plus. Potential to grow with company. $25,000

Tina J. Romens
ROBERT HALF
of Austin, Inc.
400 E. Anderson, #334
Austin, TX 78752
(512) 835-0883

ALABAMA

PROGRAMMERS

Many openings exist in the South and Southeast for COBOL and Assembler programmers with a min of 1 yrs experience.
Salary with degree $25,000
Salary without degree $21,000

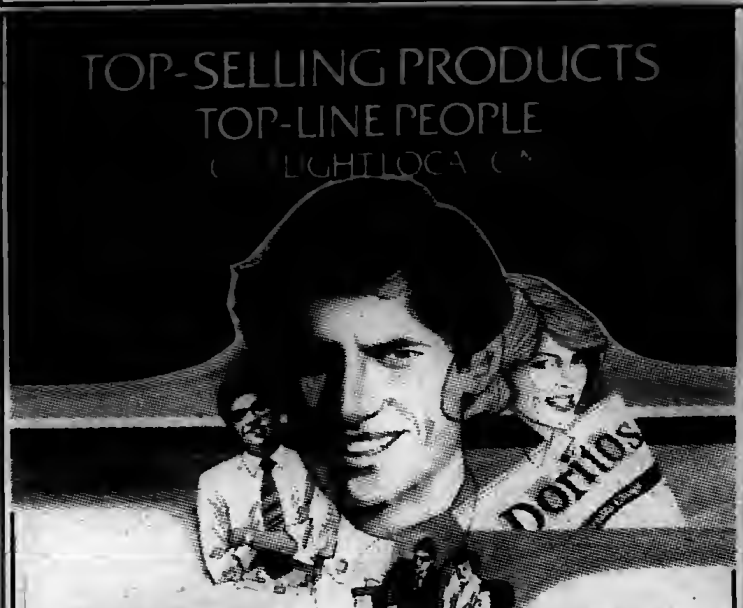
SR EDP AUDITORS

Many openings exist in the Southeast area for experienced EDP Auditors with programming and systems backgrounds. Excellent relocation benefits. Salary to $30,000

Tom Uhls
ROBERT HALF
of Alabama
3534 Independence Drive
Birmingham, AL 35209
(205) 879-4253

FREE:
Ask for our latest Salary Survey.

position announcements | position announcements | position announcements | position announcements | position announcements



Does That Tell You Something About Opportunities With Frito-Lay?

The millions of Americans who buy and enjoy Frito-Lay snack food products have made us the leader in the industry, with a 17% sales increase last year and revenues doubling to $2 billion over the past 5 years. We're proud to be the most profitable division of Fortune 100 PepsiCo, Inc., and eager to meet the challenge of gaining an even bigger share of the market in our fast-paced, fast-growing industry.

To be tops in our field means our people have to be the best in every facet of our operations. Management Information Services is no exception. The people we seek hold a BS in science or a related field, and have experience in programming, software development and data base analysis. And with Frito-Lay, they find a large scale IBM environment using MVS/JES2, ACF/ VTAM, IMS DB/DC and TSO/SPF with 750 terminal SNA network.

And what place could be better for a career than dynamic Dallas, one of the nation's most desirable areas in which to live and work? With a cost of living among the lowest of any major U.S. city and the lowest unemployment rate in the nation, this area is "home" to some 30 Fortune 1000 companies. And on top of all the other reasons that make Dallas great, none of the cities in the metroplex impose payroll or income taxes. Texas has no state income tax, either.

To find out more about your possibilities with Frito-Lay, please write: FRITO-LAY, INC., P.O. BOX 45799, DALLAS, TX 75235 ... and discover why being part of the best can be your best move ever.

Frito Lay

An Equal Opportunity Employer M/F

Field Engineering Professionals

Disk and/or DEC Experience Preferred

System Industries manufactures controllers and distributes disk/tape systems, including 300 mbyte SMD, 600 mbyte Winchester drives, and 6250 BPI tape drives. We're in our highest growth mode yet, and that means challenge ... for our employees, and for your CAREER GROWTH.

We have immediate openings for Field Engineers in Los Angeles; the San Francisco Bay Area; Washington, D.C.; and Syracuse, N.Y. What's more, we'll be hiring continually in all major metropolitan areas as our growth expands.

We're also seeking a Staff Instructor and Product Specialist for our headquarters facility in Milpitas, California.

Please send your resume to Jeanne Abbott, Employment Specialist, 1555 Barber Lane, P.O.Box 789, Milpitas California 95035. Or call her COLLECT at (408) 942-1212. We are an equal opportunity employer.

System Industries

ENGINEERS

Our client is a dynamic Northern California based company who is a world leader in control theory, computers and electronics and is currently seeking highly skilled and talented individuals in computer software.

SOFTWARE ENGINEERS:

With a BS degree and 2-5 years experience in real time, VAX/VMS Systems, Systems programs, Internals and VAX hardware with DEC PDP-11 computers knowledge including operation of RSX-11M Systems,

Our client offers outstanding professional challenge and growth opportunities combined with an excellent salary and benefits package. For immediate consideration, please send your resume and salary history, along with a statement of who you do not want your information sent to, in confidence:

BERNARD SCHANK ASSOCIATES, INC. ADVERTISING

CONFIDENTIAL REPLY SERVICE
444 Castro Street, Suite 504
Mountain View, CA 94041
ATT: DEPT CWRM-5

Our client is an equal opportunity employer

SOFTWARE SALES/SUPPORT

The World's Largest and Fastest Growing Independent Systems Software Vendor seeks qualified individuals for responsible roles in field sales and support positions. Cincom's rapid growth necessitates expansion in these areas:

MARKETING TECHNICAL REPRESENTATIVE

Responsibilities:

- Data Base/Data Communications Support
- Applications Design Consultation
- Systems Software Installation
- Data Processing and End-User Training
- Sales Support and Demonstrations

Qualifications:

- At least 3 years D.P. experience
- Knowledge of or experience with Data Base/Data Communications with systems
- Knowledge of COBOL, Structured Programming and High Level Languages
- An orientation towards End-User problem solving

MARKETING SALES REPRESENTATIVE

Responsibilities:

- Gaining trust and confidence
- Documenting of client requirement
- Presentation of concepts
- Quantification of Profitable Solutions

Qualifications:

- At least 3 years experience in Technical Sales & Data Processing
- Knowledge of Business Information Systems
- An ambition to excel
- Sensitivity to customer objectives
- A willingness to travel

Compensation dependent upon achievement. Opportunity for advancement is very high. Please forward your resume to:

Cincom Systems, Inc.
Attn: Karen Schneider/MR
2300 Montana Avenue
Cincinnati, Ohio 45211

Positions available - Boston, Buffalo/Rochester, Chicago, Dallas, Grand Rapids, Houston, Kansas City, New York, Philadelphia, Pittsburgh, St. Louis and Washington, DC.

An Equal Opportunity Employer

M.I.S. DEVELOPMENT STAFF
COLORADO OPPORTUNITIES

Presbyterian/St. Luke's Medical Center, the largest health care network in the Rocky Mountain area is expanding its corporate M.I.S. Development organization. Will plan and implement a comprehensive information system for multi-hospital organization. These newly created positions will not only provide challenging work assignments but also excellent opportunities for advancement.

PROJECT LEADER
Patient Oriented Systems

Will be responsible for analysis and implementation of patient information and hospital communication systems. Requires 5 to 8 years systems and programming experience in a hospital environment, plus minimum 3 years project management experience

PROJECT LEADER
Financial/Operating Systems

Will be responsible for analysis and implementation of corporate-wide financial and operating systems. Requires 5 to 8 years systems and programming experience, plus minimum 3 years project management experience. Hospital experience preferred.

Comprehensive salary and benefit package offered. Send resume or call:

(303) 869-2134

Presbyterian/Saint Luke's Medical Center
601 East 19th Avenue
Denver, CO. 80203
Attention: Human Resources
Equal Opportunity Employer

SOFTWARE/SYSTEMS ENGINEERS

If there's one thing you should do today, it's call this number: COLLECT (609) 234-1100

Talk to Tony Bruno, a CSC Defense Systems' Technical Director and arrange a PERSONAL INTERVIEW.

Computer Sciences Corporation believes in talking careers where it is most productive—at the top. We want you to talk to someone who knows how *your* experience can lead to bigger challenges and exceptional rewards.

You and Computer Sciences Corporation

If you're a Weapon Systems or Subsystem Designer, Production or Simulation Professional, and would like to broaden your expertise in a sophisticated rewarding environment, then we would like to talk!

Computer Sciences Corporation is the largest hardware-independent, software design and systems development company. The world's leading developer of advanced tactical and strategic command and control defense systems.

Exceptional Opportunities

Our projects provide the challenge of improving technology, the development of new architecture fully utilizing the most advanced computer/display equipment and the combining of equipment and program capabilities engineering solutions.

Make your experience count

CSC will match your experience and talent with really first class compensation packages. Top salaries, comprehensive benefits and individually tailored relocation assistance. Make the first move today. Call us.

Programmer Analysts—(Intermediate and Senior Level)

- Real-Time Computer Program Development
- Weapons System Development
- Weapons System Integration
- Command and Control
- ASW
- Simulation
- Display
- ADA
- Tomahawk, Lamps III
- UYQ-21, UYK-43, UYK-44, AYK-20, CP901/642B

Systems Programmers—(Intermediate and Senior Level)

- Real-Time Executive Development
- Operating System Design and Development
- Military Systems, AN/UYK-7, 43, 44, ADA

CSC's Defense Systems Division is coming to:

Norfolk, VA and Philadelphia, PA on July 15th;

Los Angeles and San Diego, CA on July 22nd;

Washington, DC and Long Island, NY on July 29th

If you will be in any of these cities on any of these dates, we'd like to get together. Take the first step—Call CSC.

If you are unable to meet with us at this time, please call or forward your resume in confidence to: CSC, Defense Systems Division, P.O. Box N, Dept. 220-CW, Moorestown, NJ 08057.

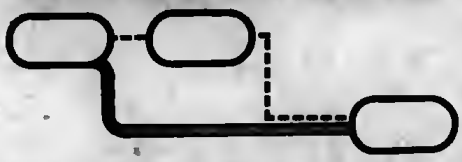
An Equal Opportunity Employer, M/F/H/V.

CSC

COMPUTER SCIENCES CORPORATION

DATA PROCESSING PROFESSIONALS

Why contact a 3rd party about our opportunities when you can contact us directly



As evidenced by the quantity and quality of response we received from this ad in the past, many Data Processors preferred to contact us directly, to be assured of receiving first hand information about career opportunities with a dynamic company - Consolidated Diesel.

We are a totally new company, created to meet the demands for manufacturing fuel efficient diesel engines in the 50-250 hp range for industrial applications. Our MIS environment, like our manufacturing facility, will be state-of-the-art.

We are looking for Data Processing professionals who want to be among the first in a start-up operation:

DATA BASE ADMINISTRATOR

Position requires at least 4 years data processing experience with a minimum of 2 years Data Base Analyst with hands-on experience in the design, implementation and maintenance of large scale data base software. Knowledge of IBM 4341 MVS, CICS, and DL/1 is helpful

SYSTEM DEVELOPMENT SPECIALISTS

At least 2 years data processing experience including design and development of major manufacturing systems. Working knowledge of COMSERV AMAPS, MRP system is helpful. Frequent user contact will be involved.

If this opportunity to contribute visibly to the immediate growth of an innovative new company is exciting to you, contact us today:

MAKE A DIRECT CONTACT

Mail this mini-resume or send your own to: Consolidated Diesel, Dept. #070-82, P.O. Box 670-A, Whitakers, NC 27891.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE HOME _____ OFFICE _____

PRESENT JOB TITLE _____

SALARY $ _____

DUTIES _____

HARDWARE EXPERIENCE _____

SOFTWARE EXPERIENCE _____

COMPUTER LANGUAGES _____

YEARS OF EXPERIENCE _____

Consolidated Diesel

A Team With Horsepower

A New Company With Equal Opportunity for Minorities, Females, Vietnam Era Veterans, Disabled Veterans and the Handicapped

MANAGER INFORMATION SERVICES

A large oilfield equipment company and a member of the Fortune 500 located in the Southwest is seeking an aggressive, highly-motivated individual as Manager of Information Services.

The manager we seek will have full responsibility for applications and operating systems implementation as well as hardware selection and start-up. The department consists of 17-20 exempt and non-exempt employees and will have the opportunity to develop this user-oriented department through the hiring of several key professionals. Immediate plans call for a systems consolidation and conversion from an IBM System 3 and a System 34 to an IBM 4341.

The top candidate must have a minimum of a Bachelor's degree in a related field and 10 years previous experience with emphasis in applications (preferably manufacturing), systems analysis, computer operation responsibility, data base installation and RPG to COBOL conversion.

We offer a competitive salary and bonus plus a strong benefits program, including relocation and a rewarding results-oriented working environment. Send salary requirements and history of accomplishments to:

CW-A3291
Computerworld
Box 880
Framingham, MA 01701

Equal Opportunity Employer

SYSTEM SOFTWARE PROGRAMMER/DESIGNERS

Cincom Systems, the world's leader in data base/data communication software is seeking highly motivated professionals to join the product development team at our Cincinnati headquarters. Cincom is currently involved in a number of new large and complex software projects that require individuals of the highest caliber.

Programmer/Designers are needed to participate in all phases of software development within the data base communication areas. The candidates chosen will possess:

- *A working knowledge of large frame IBM operating systems and access methods*
- *A minimum of 2 years experience in Assembler language or equivalent.*

These special skills are desirable:

- *Telecommunication Software experience (VTAM)*
- *VSAM*
- *Data Base Design/Administration*
- *PASCAL or other high-level language*
- *Structured techniques and modern practices*
- *Project management.*

Further opportunities are available throughout the U.S. and Europe to qualified Product Support candidates.

Cincom Systems, Inc.
Karen Schneider/PD
2300 Montana Ave.
Cincinnati, Ohio 45211
513/662-2300

An Equal Opportunity Employer

PROGRAMMERS PROGRAMMER/ ANALYSTS

HARDWARE • SOFTWARE

If you have one or more years experience on any of the following:

- IBM 370/3033/4331/4341/8100 · VM/CMS/CICS/OS/VSI/MVS/DOS/VSE/VSAM · COBOL/ASSEMBLER/IMS
- HONEYWELL 6000 SYSTEMS/LEVEL/6/66/40 DUAL/IDS/DM4/COBOL/GCOS/GMAP
- UNIVAC 1100 (EXEC II) OR 90 SERIES (OS 3) OS 1100 OR OS/3 INTERNALS DMS · 1100 TIP/CMS/QLP/ASC 11 COBOL
- DEC · PDP 11/23/34/44/45/70 · VAX 11 780 RSX 11M-K RSTS/E VAX VMS MACRO · 11, BASIC 2, FORTRAN/ASSEMBLY LANGUAGE
- NCR 8550/8650/8250 VRX/IMOS/STORE IV TRAN PRO · NEAT 3/COBOL ON LINE · SPECIAL NEED FOR CIF
- BURROUGHS 3800/4700/6700/6800 ALL SOFTWARE NEEDED

and would like the most individualized job search in data processing today on a company fee paid basis, nationally, send your resume in confidence to:

SOUTHERN COMPUTER SERVICES
P.O. DRAWER 2679
SARASOTA, FLORIDA 33578
Toll Free 1-800-237-6701

PRODUCT MANAGER/GEOMETRIC SPECIALS - A design and manufacturing leader in the rapidly growing field of mini-computer based interactive graphic systems for major industries, has an immediate need for a highly skilled Product Manager/Geometric Specials to: (1) provide specifications and technical input for the product definition stage of Computervision's geometric modeling package, (2) provide product specifications for future development in surface modeling, and (3) to interface with other groups in geometric modeling development. Minimum requirements include a Master's degree in Engineering or Computer Science together with at least 10 years relevant experience involving (1) basic curve and surface definition, and (2) industrial geometric modeling requirements with an emphasis on the automotive, aerospace, and shipbuilding industries. Total experience must also include at least 4 years relevant experience with turn key CAD/CAM Systems and demonstrated experience with the software development process. Starting salary is $45,000 per year for a five day, forty-hour work week and includes medical, life and disability insurances, two weeks annual vacation and other industry-competitive benefits. Qualified applicants respond with resume only to CW-A3289, Computerworld, Box 880, Framingham, MA 01701. An Equal Opportunity Employer

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, unemployment, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligation, please call or write Keith Rushton, CPC, Data Processing Specialist.

Dunhill
OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28211
800-438-6018
(NC Call)
(704) 542-2018

Manager of Academic Computing
University of Southern Colorado
Pueblo, Colorado

12 month administrative position reporting to the Director of University Computing. Individual responsible for: Providing the leadership necessary to establish an environment conducive to excellence in academic computing; working with administrators and faculty to identify needs and directing; focal point for dissemination of computing information to the user community; the liaison between user community and computer center; coordinating/supervising student consultants; short/long range planning including grant applications. M.A. Degree required, Ph.D. preferred. 5 years relevant experience, preference given to University environment. Working knowledge of at least 3 programming languages. Familiarity with graphics and statistical packages. Starting date: August 30, 1982. Salary: $27,000-32,000. Closing date postmarked by August 16, 1982. Completed applications must include letter of intent, resume, names, addresses, and phone numbers of three references verifying professional experience. Submit to:

Search & Screen Committee
for Manager, Academic Computing
c/o Director, University Computing
University of Southern Colorado
2200 North Bonforte Blvd.
Pueblo, CO 81001
AA/EOE

position announcements | position announcements | position announcements | position announcements | position announcements

San Francisco Bay Area at it's Best

We're one of the Best EDP placement specialists in the San Francisco Bay Area. We know what companies are offering the best technology. Who's paying the best salaries. Where the best growth opportunities are.

We guarantee you personalized, professional help in matching your skills and ambitions to a career that will bring you the recognition and financial rewards you are seeking.

If you're an experienced D. P. Professional CALL COLLECT or RUSH your resume TODAY

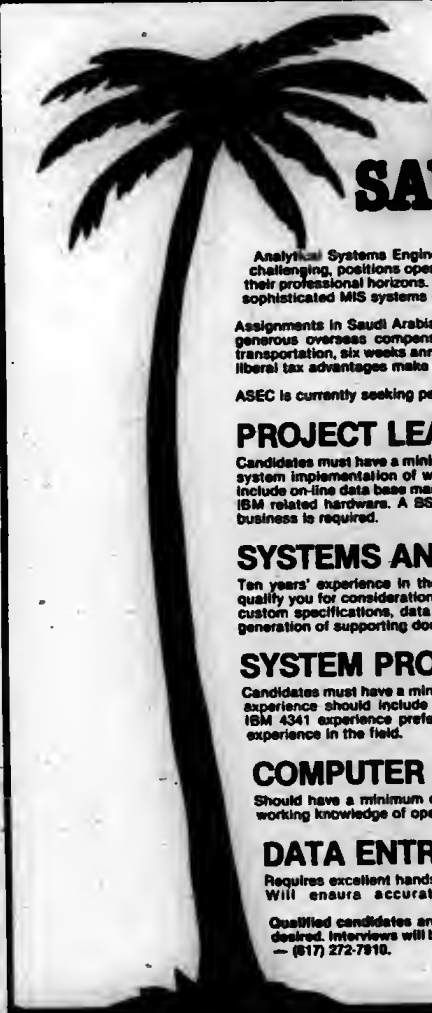
LOGICAL OPTIONS
One Market Plaza, Spear Tower, Suite #2014C
San Francisco, CA 94105 • (415) 777-3900

Computer Systems Manufacturer requires Manager, Communications Product Planning to supervise communication product planning department; manage current and future software communication products; analyze needs of communication product direction in terms of market needs and available software technology; formulate product plans and set long term technical goals for corporate planning purposes; write product requirement documents for future communications products. Qualified individual will have Master's in computer science and 2 years experience in job being offered or 5 years experience in computer communications network. Also requires proven ability to manage high technology planning and development at a state-of-the-art level; sufficient oral and written communication skills to prepare product requirement documents for technical and management personnel; sufficient familiarity with telecommunications product development in both commercial and academic contexts to inform management of the direction of current and future relevant technologies; solid working knowledge of computer software systems analysis and computer networks. Salary: $22,400/year M-F, 8 to 5. If interested please contact: Ms. Baker, Florida State Employment Service, 105 E. Broward Blvd., Ft. Lauderdale, Fl. (305) 462-8641. Job Order #3482266.

NEW HAMPSHIRE
$25 - $60K
Applications and Systems Software
Micro/Mini/Mainframe

Management Advisory Services Inc
Colonial Office Park
48 Constitution Drive
Bedford, NH 03102
(603) 472-8844
Fees and relocation expenses company paid.

MIS OPPORTUNITIES SAUDI ARABIA/USA



Analytical Systems Engineering Corporation (ASEC), a growing service organization has immediate, challenging, positions open in the U.S. and Saudi Arabia for MIS professionals interested in expanding their professional horizons. ASEC is helping the Kingdom of Saudi Arabia develop one of the most highly sophisticated MIS systems ever devised utilizing advanced state-of-the-art hardware and software.

Assignments in Saudi Arabia are for two years. During your two year stay, ASEC will provide you with generous overseas compensation. Much of this can be banked since ASEC also provides housing, transportation, six weeks annual leave with air fare, and a host of other benefits. All this in addition to the liberal tax advantages make this a unique, once-in-a-lifetime opportunity.

ASEC is currently seeking people with professional systems skills in the following areas:

PROJECT LEADERS

Candidates must have a minimum of 15 years' experience in the technical aspects of large-scale computer system implementation of which at least 4 years should have been in management. Experience should include on-line data base management systems, systems software, commercial application software, and IBM related hardware. A BS degree in Engineering or a technical field and an MA in management or business is required.

SYSTEMS ANALYSTS

Ten years' experience in the technical aspects of large scale computer systems implementation will qualify you for consideration. Experience should include systems software, analysis and development of custom specifications, data base design, development of system program interface requirements, and generation of supporting documentation. A BS degree in a technical field is required.

SYSTEM PROGRAMMERS

Candidates must have a minimum of 5 years' experience in large scale computer system projects. Overall experience should include systems program design, development, test and debugging. COBOL and IBM 4341 experience preferred. A BS degree is preferred; however, we will consider commensurate experience in the field.

COMPUTER OPERATORS

Should have a minimum of 2 years' experience as an operator, preferably with IBM hardware and a working knowledge of operating systems and DOS/VSE.

DATA ENTRY CLERKS

Requires excellent hands-on input skills and a minimum of 1 year's experience as a data entry clerk. Will ensure accurate keying of source data and operate data entry terminals.

Qualified candidates are invited to respond by resume immediately indicating position and location desired. Interviews will be held in July. Telephone our personnel department for additional information — (617) 272-7910.

ANALYTICAL SYSTEMS
ENGINEERING CORPORATION
OLD CONCORD ROAD
BURLINGTON, MA 01803

ASEC

Your Ultimate Choice

TAX FREE INCOME & STATE-OF-THE-ART
Salary Area
$60,000 +

Aren't you tired of the talk and reality of recession, high interest rates, inflation, etc? Well, you soon will have the opportunity to interview for a position that will change your entire financial situation for the better.

Our exclusive client will be holding interviews in mid July for positions in the most technologically advanced computer center outside the USA.

We are looking for people with the following expertise:

- Reservoir simulation development
- Geophysical interpretation
- Exploration processing
- Data Base Management
- Geological/geophysical application development
- Seismic programming
- Graphics applications
- Technical applications

For immediate consideration and further information, please contact:

Jo Schneider (713) 461-7777
Cliff Reilly
Ada Edwards
Marilyn Thomas (713) 445-8484
Gaylynn Lieb (713) 658-9898

ALL FEES ASSUMED BY CLIENT COMPANIES NEVER A CONTRACT TO SIGN

M. david lowe
PROFESSIONAL SERVICES

478 Houston Natural Gas Bldg.
1200 Travis
Houston, Texas 77002

Software Engineer II

TASKS:

Participate as a team member and chief engineer for a High Level Language Debug project, assist in the creation of all project plans, design documents, and implementation code; design and code major subsystems of the product. Design the interface between the product and a computer product. Identify technical problem areas and recommend solutions. Record changes to all project technical documentation. Answer routine technical questions from support groups and other project groups. Review the evaluation test plan, and help them solve simple problems.

COMPETENCIES REQUIRED BY THE TASKS:

BS in Computer Science and 4 years prior experience as a Software Engineer I OR MS in Computer Science and 2 years prior experience as Software Engineer II. Experience with the development of a least one multiprogramming system.

Thorough understanding of interactive High Level language debugging techniques. Experience with multiprogramming techniques. Thorough understanding of all elements of computer design. Thorough understanding of the Pascal programming language and at least one other comparable high-level language. Thorough knowledge of assembly language programming. Familiarity with structured program development methodologies, such as Yourdon's SA/SD or Softech's SADT.

Excellent oral and written communication skills and the ability to interface with several other groups on related technical topics. Good interpersonal skills. Must be able to design and implement from user-level specifications. Must be capable of making design trade-offs to meet schedules. Commitment to schedule is expected. Salary range is $26,830 to $31,940 based on qualifications, benefits include educational support, insurance and profit sharing program.

Apply to Oregon State Employment Division, Job No. 1750588, Room 208, 875 Union St., N.E., Salem, Oregon 97311.

Software Instructor

NCR/Columbia—a major facility of a multi-billion dollar computer company—specializes in the design, development and manufacture of microcomputers, data communications and word processing systems. We seek a Software Instructor for our Internal Educational Group.

Responsibilities will include instructing engineers and programmers in various software areas, high level and Assembly level languages, use of operating systems and structured design. You will also be in charge of course development and upgrading classroom materials as new software and systems are developed. A BSCS with teaching experience or a BS in Education with experience in teaching programming courses is required.

For immediate, confidential consideration, please send your resume and salary history to Mr. Glenn Rannick, NCR Corporation, Dept. J68, 3325 Platt Springs Road, West Columbia, SC 29169.

NCR
Complete Computer Systems
An equal opportunity employer

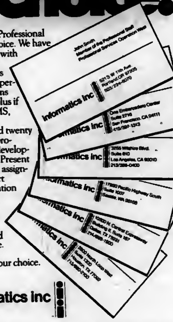
Consultants, Analysts and Programmers

Your Choice.

You can join Informatics' Professional Staff at the location of your choice. We have openings for DP Professionals with growth-oriented technical and consulting skills. Requirements include at least two years of experience on large-scale IBM systems using COBOL or PL/1. It's a plus if you also have experience in IMS, MARK IV® or CICS.

Informatics has completed twenty successful years of providing professional services for systems development and consulting projects. Present activity includes development assignments on major state-of-the-art systems for a variety of application areas. The most advanced development techniques are emphasized for all assignments.

If you are interested in a professional career, pick a card for the location of your choice. Call collect or send a resume immediately to the office of your choice. We are an equal opportunity employer.



Informatics inc

521 S.W. 11th Ave.
Portland, OR 97205
503/224-6070

3255 Wilshire Blvd
Suite 610
Los Angeles, CA 90010
213/386-0400

10300 N. Central Expressway
Building II, Suite 167
Dallas, TX 75231
214/696-1900

One Embarcadero Center
Suite 2716
San Francisco, CA 94111
415/397-1313

17930 Pacific Highway South
Suite 1007
Seattle, WA 98188

2900 North Loop West
Suite 1300
Houston, TX 77092
713/680-2100

HARTE-HANKS COMMUNICATIONS, INC.

a diversified and growing NYSE company with nationwide interests in newspapers, radio, television, market research, distribution and trade publications has immediate openings at our Corporate Office in SAN ANTONIO for

ANALYST/PROGRAMMERS
and
SENIOR ANALYST/PROGRAMMER

Successful candidates will be user oriented with a minimum of two years COBOL experience. Some travel will be required. Our on-line programming environment is fast-paced and challenging. Knowledge of Burroughs medium systems, HP3000, or MDS 21 are a plus.

Harte-Hanks offers competitive salaries, an incentive bonus plan and a benefit package that includes group hospitalization and life insurance, dental plan, credit union, pension plan, stock purchase plan, tuition assistance plus paid vacations, holidays and more.

Please send your resume and salary history to:

Sue Bachman
Harte-Hanks Communications, Inc.
P.O. Box 269
San Antonio, Texas 78291

We are an equal opportunity employer M/F

Sales/Marketing Manager Software

InterSystems is a software firm with world-wide clients, a superb reputation among its customers, and a solid record of financial success. We seek an experienced Software Sales/Marketing Manager to spearhead an aggressive program to exploit rapidly expanding market opportunities for ISM, our ANSI-Standard MUMPS software system for PDP-11 and VAX.

You will be based at our attractive Boston waterfront office, with complete demo facilities and support staff available. Principals only.

InterSystems

InterSystems Corporation
210 Commercial Street / Boston, Massachusetts 02109
Telephone 617 227-1555

DIRECTOR OF COMPUTER SERVICES

Edison State Community College is seeking a Director of Computer Services to manage the computer operations, academic programs, and the entire administrative data processing system. The applicant should have at least 5 years of data processing experience with small or medium scale systems (DEC 11/44, IBM 370/125) and should have at least 2 years of high level management experience in all aspects of college record systems. It is essential that the applicant have excellent oral and written communication skills. Exposure to community college environment is desirable. The applicant should be familiar with BASIC, COBOL, FORTRAN, RPG II and the RSTS/E and DOS/VSE operating systems. Applicants with a Master's Degree in a computer related discipline, or equivalent experience, are preferred. Deadline for applications: July 26, 1982. Direct inquiries to:

Dr. Floyd V. Hauser
Edison State Community College
1973 Edison Dr.
Piqua, Ohio 45356
(513)778-8600 x264
An Equal Opportunity Employer

COMPUTER PROGRAMMER/ANALYST

Opening for computer programmer/analyst to design, apply and program computer systems. Design functions include input and output layout and data base management, application functions include sales analysis, inventory analysis, payroll analysis, order entry and billing, responsible for all programming functions. Position is with data processing department of manufacturer of chains, agricultural implements and related products located in St. Louis, Missouri. Qualified applicants must have bachelors degree in any academic field of study plus certificate of graduation from trade school program in computer programming and operations. Qualified applicants must also be familiar with COBOL and RPGII computer languages, and be proficient in IBM S/3 Communication Control Programming. Starting salary $20,000.00 per year plus company employee benefit plan for 40 hour week. Send resume including documentary evidence of familiarity with COBOL and RPGII and proficiency in IBM S/3 Communication Control Programming to: Ms. June Carroll, ID# 638446, JOB SERVICE, 505 Washington Avenue, St. Louis, Missouri 63101. An equal opportunity employer

MANAGER TECHNICAL SERVICES

GOLD CIRCLE is a fast growing and successful mass merchandising division of FEDERATED DEPARTMENT STORES. Our rapid expansion has created an opening for a Manager of Technical Services in our Columbus, Ohio headquarters. A career with Gold Circle offers outstanding advancement potential and an excellent salary and benefits package.

The ideal candidate should have the following qualifications:
- An extensive background in management of Technical Services functions
- Experience in hardware/software evaluation and communication systems
- Successful record managing technical support function

Reporting to this position will be the Project Managers, in the areas of Resource Management, Software Systems, and Communication Systems. Responsibilities will include operating systems software, evaluation, and network operations.

Gold Circle is a competitive EDP environment offering the latest in the state-of-the-art hardware and software. Please send resume and salary history to: NAS Confidential Reply Service, Box 106, 50 W. Broad St., Suite 1817, Columbus, Ohio 43215

Gold Circle

An Equal Opportunity Employer M/F

FACULTY POSITION VACANCY IN ACADEMIC COMPUTING
PROGRAMMER/CONSULTANT

Under supervision of Director of Academic Computing and Research Services. Will write, maintain and provide user documentation for computing procedures; consult with staff and faculty concerning instructional and research applications, and provide faculty and staff training programs. Masters Degree in appropriate field or Bachelors with applicable work experience. Proficiency in one or more computing languages, knowledge of operating systems and familiarity with software packages such as SAS or SPSS, formal training in Statistics and Research Design helpful. Experience in both batch and time sharing environments. Experience as Consultant or Programmer in Educational Computing Center desirable. Salary commensurate with education and experience. Send resume, three letters of recommendation and transcript to Office of Academic Affairs, Western Kentucky University, Bowling Green, Kentucky 42101 by August 6, 1982.

An Affirmative Action/ Equal Opportunity Employer.

MARKETING MANAGER

An internationally acclaimed word processing firm is seeking a Mkt. Mgr. to direct the marketing (sales) efforts of company within the Financial sector including introduction of Philips Financial Terminal systems. Manage the introduction of Philips Mini computers for shared Word/office mail systems and related products to national accounts. Ideal candidate will possess thorough knowledge of the Micom line of products including Philips PTS6000 mini computers and terminals. Extensive knowledge/experience in network configuration and installations, preferably on related products. A degree in Computer Science, Marketing or Business is required and 3-5 years exp. in sales/mkt. Salary $55k/yr. Direct inquiries to: Texas Employment Commission, Dallas, TX 75201 or TEC, Austin, TX 78778, J.O. #2729956.

"Ad Paid By An Equal Employment Opportunity Employer"

SYSTEMS ANALYST

Ground floor opportunity for experienced systems analyst to participate in a growing business.

Background in the following areas is a definite plus: Structured Design, Communications, DDP, Methodology.

We are an established, multi-million dollar data processing organization currently expanding into leading edge areas.

Send resume or address inquiry to:

Louise M. Sharrer
General Manager
Information Products Div.
HCS Inc. - Dept 101
615 Franklin Turnpike
Ridgewood, NJ 07450
(201) 444-4028

An Equal Opportunity Employer

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide, you decide.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
P.O. Box 5013
Cherry Hill, New Jersey 08034
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Walton Road
Blue Bell, Penna. 19422
(215) 629-0595

RSVP SERVICES
Employment Agents for Computer Professionals

UNIVERSITY OF MIAMI SCHOOL OF MEDICINE

The Comprehensive Cancer Center seeks a Systems Manager to provide overall systems support for its Computer Facility primarily used by research scientists in a multidisciplinary environment. Bachelors Degree, experience with DEC PDP 11/70 computers and ability to program in BASIC +2 and MACRO-11 are required. Experience with the RSTS/E operating system is highly desirable. Send your resume with salary history to Robert C. Duncan, Ph.D., Comprehensive Cancer Center, P.O. Box 016960 (D8-4), Miami, Fla. 33101.

Affirmative Action/ Equal Opportunity Employer

COMPUTER SCIENCE INSTRUCTOR

Appropriate Master's degree with 2 or more years experience in computer programming in a "Business Data Processing" environment. Appropriate teaching experience. If interested please apply to:

Personnel Dept.
DAYTONA BEACH COMMUNITY COLLEGE
P.O. Box 1111
Daytona Beach, Fla. 32015
An Equal Opportunity Employer M/F

DATA PROCESSING MANAGER

Large growing manufacturing firm headquartered in Southern Maine seeks Manager to direct a staff of five and lead ambitious project development schedule. Requirements: Bachelor's Degree in Computer Science, programming in Cobol, familiar with large NCR/IRX SYSTEMS, three - five years experience in similar position, further accounting and managerial systems background. Good salary and benefits. Submit resume with salary history and requirements to:

Personnel Office
PRIME TANNING COMPANY, INC.
Sullivan St.
Berwick, Me 03901

RELOCATION

No one does it better than NCA.

The main reason we formed National Computer Associates was to help computer professionals who wanted to relocate to a favored area. In the beginning there were many complex problems needing solutions. Now, however, after more than ten years, NCA has developed and refined relocation strategies to the point of near perfection.

Today, through the use of our national network and our effective systems, you can get an excellent career advancement position anywhere in the U.S.A. . . . and before you move. It's easy. Simply contact the NCA firm nearest to you and they'll go to work for you immediately. There will be no cost to you whatever because employers pay our fees . . . and will pay most, if not all of your relocation expenses. Come in. Call. Or mail your resume. Confidentiality is assured.

Relocation . . . no one does it better than NCA.

ATLANTA: BAI Limited
229 Peachtree Street, Suite 1601-C
Atlanta, Georgia 30303 (404) 581-0040

BOSTON: Robert Kleven and Co., Inc.
North Brook Park, Suite One, 181 Bedford Street
Lexington, Massachusetts 02173 (617) 861-1020

CHICAGO: Thos. Hirtz & Associates
150 N. Wacker Drive, Suite 1700
Chicago, Illinois 60606 (312) 977-1555

CLEVELAND: Professional Staffing Systems, Inc.
4807 Rockside Road, Suite 300
Cleveland, Ohio 44131 (216) 524-5500

COLUMBUS: Michael Thomas, Inc.
65 E. Wilson Bridge Road, Suite 201
Worthington, Ohio 43085 (614) 846-0926

DALLAS: DataPro Personnel Consultants
12720 Hillcrest, Suite 520
Dallas, Texas 75230 (214) 661-8600

DENVER: EDP Infinity, Inc.
P.O. Box 2468
Littleton, Colorado 80161 (303) 850-5490

DETROIT: Electronic Systems Personnel, Inc.
3000 Town Center, Suite 2580
Southfield, Michigan 48075 (313) 353-5580

FLORIDA: Data Sciences Personnel, Inc.
P.O. Box 8577
Hollywood, Florida 33024 (305) 434-6112

HARTFORD: Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105 (203) 549-4240

HOUSTON: Career Consultants, Inc.
2000 South Post Oak
Houston, Texas 77056 (713) 626-4100

INDIANAPOLIS: Computer Personnel Services, Inc.
107 N. Pennsylvania
Indianapolis, Indiana 46204 (317) 634-4712

LOS ANGELES: Constellation Enterprises
3250 Wilshire Boulevard, Suite 607-K
Los Angeles, California 90010 (213) 487-0616

MILWAUKEE: EDP Consultants, Inc.
11430 W. Bluemound Road
Milwaukee, Wisconsin 53226 (414) 475-0077

MINNEAPOLIS: Electronic Systems Personnel
858 Iowa City Federal Tower, 121 S. 8th St.
Minneapolis, Minnesota 55402 (612) 338-6714

NEW JERSEY: Systems Search
2040 Milburn Avenue
Maplewood, New Jersey 07040 (201) 761-4400

NEW YORK: Botel Associates, Inc.
7 Dey Street, Suite 410
New York, New York 10007 (212) 227-7370

NEW YORK UPSTATE:
CFA Associates Personnel, Inc.
2530 James Street
Syracuse, New York 13206 (315) 463-5225

NORTH CAROLINA: DataMasters,
Div. of TaskForce, Inc., P.O. Box 6888
Greensboro, North Carolina 27405
(919) 373-1461

PHILADELPHIA: Systems Personnel, Inc.
115 West State Street
Media, Pennsylvania 19063 (215) 565-8860

PHOENIX: Professional Career Consultants
4628 North 17th Street, Suite H101
Phoenix, Arizona 85016 (602) 274-8666

SAN DIEGO: Electronic Systems Personnel Agency
2667 First Avenue
San Diego, California 92103 (714) 239-0811

SAN FRANCISCO: The Computer Resources Group
Inc. Agency, 303 Sacramento Street
San Francisco, California 94111 (415) 398-3535

SEATTLE: Houser Martin Morris & Associates
1940 116th Avenue N.E.
Bellevue, Washington 98004 (206) 453-2700

WASHINGTON D.C.: ESP Systems Corporation
914 Lamberton Drive
Silver Spring, Maryland 20902 (301) 649-6171

National Computer Associates

Intelligent Multiplexer Software Development

We have exciting opportunities in microprocessor software development for our industry-leading statistical multiplexer. According to a recent 1982 brand preference survey of the Data Communications market, users preferred to do business with Racal-Milgo and felt that our multiplexer had the best price/performance ratio in the industry.

We have several positions open depending upon your level of experience. The ideal candidate will possess a real-time software background, preferably writing in Assembler for 8085, Z-80 or M-6809. A knowledge of communications protocols would be helpful.

Racal-Milgo offers excellent salaries, complete company benefits including 100% paid tuition, life/medical/dental insurance and one of the most pleasant working environments in South Florida. Please send your resume to Alan MacFarland or call collect 305/593-8842 for more information.

Racal-Milgo® RACAL

7800 W. Oakland Park Blvd
Sunrise, Florida 33321

Equal Opportunity Employer

Data Processing Operations Professionals

San Francisco

Our client, a major financial institution, has engaged us to find a number of EDP Operations Professionals. All of the positions offer excellent compensation.

State-of-the-Art IBM 370 or 3081/3033 MVS, IMS, CICS, TSO/SPF skills required. Management, supervisory, and technical positions are available in Computer Processing, Operations Support and Telecommunications.

We are consultants to management. If you can meet the challenge of a multi CPU MVS environment, send a detailed resume and salary history to **CW-A3288, Computerworld, Box 880, Framingham, MA 01701.**

Employer assumes fee.

SOFTWARE PROGRAMMERS

Apply your knowledge of programming to software development!

Recognition Equipment, world-wide leader in the development of document processing systems, seeks Programmers with at least 5 years' experience in Assembly language programming on mini or microcomputers, a real-time systems background, and knowledge of Intel 8086 or other microprocessors. Experience with General Automated mini systems is desired.

If your experience lies in these or any other related areas, you'll enjoy an excellent compensation package, a career position with responsibility, and life in the heart of Dallas/Ft. Worth.

If it's time for a change, then it's time for Recognition. Call Fran Hollingsworth today, (214) 579-6062, or submit your resume to:
P.O. Box 222307/Dallas, Texas 75222.

Recognition

Recognition Equipment Incorporated
An Equal Opportunity Employer M/F

SENIOR SYSTEMS ANALYST PROGRAMMER

(CERRITOS COLLEGE)

DEC SYS/10 COMPUTER CTR

SALARY: $2043 - $2483 per mo., + college pays for family medical/dental benefits. HOURS: 40 hour workweek, hours are flexible. QUALIF: Comb equiv 2 yrs college training in EDP + 2 yrs exp. in programming, incl. knowledge & exp. in use of COBOL language. FINAL FILING: JULY 30, 1982. For Application & Info, Contact:

PERSONNEL OFFICE
CERRITOS COLLEGE
11110 E. Alondra Blvd., Norwalk, CA 90650
(213) 860-2451, Ext. 269

SUNSHINE STATE

Florida's financial community is booming!!
Our clients need your expertise

Analysts/Prog's	
Cobol with IMS DB/DC, CICS	to 30K
Cobol, GL, Payroll, IL, CL, DDA	to 25K
Credit card Exp. IBM, TANDEM	to 36K
Cyborg Payroll, Acctg IV	to 21K
Cobol, DOS, Cost Acctg	to 28K
DEC PDP 11, Fortran, RSX11M	to 28K
Burroughs S & L or Banking	to 26K
PROJECT-MGMNT	
Proj. LDR - Deposits	to 32K
Proj. LDR - CPCS	to 35K
Proj. LDR - Order Entry, IMS	to 30K
Capacity Planning - MVS, IMS	to 35K
Software Support	
BAL & exp. w/MVS VS,VM,DOS	to 35K
IMS DB/DC, CICS	to 35K
ACF/VTAM, NCP	to 32K
Software Engr-Telecommunications	to 33K
IMS Data Base Analyst	to 34K

AVAILABLE, INC.

MIS CONSULTANTS

MIS Specialists Needed Nationwide To Become Consultants

Major consulting firms need consultants at staff, Senior Consultant, and Manager level in major cities nationwide. If you have outstanding technical and interpersonal skills, you can move into consulting NOW. A consulting career offers unparalleled professional challenge, variety, exposure, rapid advancement, travel and excellent compensation.

Qualified candidates need 2 to 8 years experience with large mainframes or minicomputers as programmer, systems analyst, project leader or EDP auditor. Degree required. MBA a plus. Excellent communication skills, good business image and flexibility to adapt to a variety of situations are necessary.

Starting salary $26,000 to $45,000; successful consultants will double their salary in 3 years.

Send resume to CONSULTANT RECRUITERS. Reply to:
CW-A3286
Computerworld
Box 880
Framingham, MA 01701

position announcements | position announcements | position announcements | position announcements | position announcements

Find Out How It Feels To Work With A Company That Listens

Are you a data processing professional experienced with Sperry Univac's commercial product line who is interested in exploring career options with an industry leader? If so, please read on.

PROFESSIONAL OPPORTUNITIES

Our recruiting target is the experienced Univac Systems Programmer/Systems Analyst. Specifically of interest are systems programming skills on the 1100 SERIES (OS/1100 or EXEC 8) or 90 SERIES (OS/3). Your technical background should reflect one or more of the following: Software installation; Sysgens; Dumpbusting; Problem resolution; Communications software & protocols; TELCON; TIP; DMS-1100; COBOL; Assembly; Applications programming; Pre-sales surveys & presentations; Technical proposal writing; Benchmarking.

Positions are currently available in the areas of PRE-SALES TECHNICAL MARKETING SUPPORT and ON-SITE TECHNICAL SUPPORT.

GEOGRAPHICS

Current opportunities include a wide variety of domestic locations, featuring both rural and urban environments. Relocation Assistance available.

HOW TO PROCEED

If you possess the aforementioned skills, we are interested in discussing the technical challenges; professional training, and career development available at Sperry Univac.

Call **Deborah Kidwell collect** at **703/556-5180** during business hours or forward a resume in confidence to Sperry Univac, Federal Systems Operation; 8008 Westpark Drive; McLean, VA 22102; Attn: Staffing & Development. An Equal Opportunity Employer. Sperry Univac is a Division of Sperry Corporation.

FEDERAL SYSTEMS

SPERRY UNIVAC

The computer people who listen

DIRECTOR INFORMATION SYSTEMS

THE UNIVERSITY OF IOWA
HOSPITALS AND CLINICS

The Information Systems Department supports the patient-oriented computing requirements for The University of Iowa Hospitals and Clinics. The Department is currently developing a patient centered Hospital Information System. Application development and operation is carried out on two IBM 3033N's under MVS utilizing PL/I and IBM's Patient Care System. The system currently supports 375+ terminals in applications ranging from patient registration and appointment scheduling to laboratory result reporting.

The Director provides the overall leadership and direction in the strategic planning, administrative, and operational activities of the Hospital's Information Systems Department. A Master's degree in a Computer Science related area or an equivalent combination of education and experience is necessary. Progressively responsible and extensive technical, administrative, and supervisory experience in health care and related data processing is required.

Send resume and salary history to:
David E. Wood
Information Systems Department
University of Iowa
Hospitals and Clinics
Iowa City, Iowa 52242

The University of Iowa is an Equal Opportunity/ Affirmative Action Employer

MANAGER

Operating Systems Programming Manager for Univac 1100/82 systems group. Bachelor's degree or equivalent experience, 3 years operating systems maintenance experience, plus communications, documentation and management abilities are required. Some hardware and high level programming language experience is desired. Salary open to $33,000; fringe benefits including paid education are provided. Resumes to: **Charles Rollins, Systems Development, Memphis State University, Memphis, TN 38152, by noon July 21, 1982.**
EOE M/F

PROGRAMMER-In charge of structuring, coding & debugging programs for application relating to financial institutions. 4 yrs High School. Must have knowledge of COBOL, BAL, CICS & IMS. 2 yrs exp. $24,000 p.a. to work 40 hrs/5 days/wk. **Please send resumes: Software Design Associated, Inc. 71 Fifth Avenue New York, NY 10003**

SOFTWARE ENGINEER

Ziyad is sharing the tremendous growth of the word processing industry - making sophisticated equipment that complements a wide range of systems produced by other manufacturers. Utilizing state-of-the-art microprocessor technology, we introduce a new level of productivity and cost-efficiency to office operations.

Continued expansion of our dynamic young company has created a position for a Software Engineer with a minimum 3 years experience developing real-time applications in assembly language for microprocessors. Experience should also include the design and generation of I/O drivers.

In addition to competitive salaries and liberal benefits, we offer a pleasant working environment, convenient location and outstanding potential for the future. Apply by sending resume to, Personnel:

ZIYAD

100 Ford Road, Denville, New Jersey 07834
An Equal Opportunity Employer M/F

We Specialize in
DATA/VOICE COMMUNICATIONS
$25K to $45K
We have many outstanding opportunities throughout the nation.
Voice/Data Networking
Hardware/Software

Fortune
Personnel Consultants
164 Broad St. Dept. C
Nashua, N.H. 03063
(603) 889-9000

Regional Sales Representatives

If you are a dynamic and career oriented sales person with a strong desire to succeed looking for a challenge, we're ready to challenge you.
We are a California based young progressive microcomputer system and component manufacturer. Our dynamic growth and future products require the establishment of regional sales positions for professionals in several locations. We are looking for (3) three Sales Professionals who understand and demand the value of a "NO-CAP" commission plan. If you have microcomputer sales experience with the knowledge of CP/M, OASIS, PUNDO-DAS, UNIX or other systems send us your current resume for immediate consideration.
Reply to CW-A3886
Confidential
Box 880
Framingham, MA 01701

COMPUTER PROGRAMMING INSTRUCTOR
USE YOUR TALENTS...teaching in our 2 year Associate Degree Program in Computer Programming. We seek an instructor with a Bachelor's Degree or equivalent in computer science or related field and 2 years occupational experience. Teaching experience is preferred. We teach and maintain our curriculum program centered around Basic, Fortran, RPG, PL/1, Assembler, OS/JCL and COBOL. Knowledge of systems analysis desirable. Deadline for application: July 30th, 1982. Call or write for application: Personnel Dept.
402-449-8426
Metropolitan Technical Community College
P.O. Box 3777
Omaha, Nebraska 68103
An Affirmative Action Equal Opportunity Employer

Programmers/ Systems Analysts

(Mfg. experience a plus)
When EDP jobs are numerous, confusion frequently clouds your selection process. Why not let CAREER SPECIALISTS of New England, a professional placement agency, help you sort out your choices? Please send your resume to: CAREER SPECIALISTS OF NEW ENGLAND, INC., 88 Chapel St., P.O. Box 1084, Portsmouth, NH 03801. (603) 436-6265. Our nationwide client companies pay our fees.

RESULTS

Whether you're buying; selling, swapping, hiring or looking, you get results from Computerworld classifieds.

Maybe that's why Computerworld gets more classified advertising than all the other computer publications put together!

MAINE

We have specialized in data processing professional placement in Maine for almost a fifth of a century. If you qualify for positions in the $25-35,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC
477 Congress St.
Portland, Maine 04101
(207) 773-4744

PROGRAMMER-In charge of structuring, coding & debugging programs for applications relating to financial institutions. B.Sc. or equivalent in Computer Science, Economics or Physics. Must have knowledge of COBOL. 2 yrs or 2 yrs related experience in programming. $24,000 p.a. to work 37½ hrs/5 days/wk. **PLEASE SEND RESUMES TO: CAP-CPP Services, Inc. 521 Fifth Avenue New York, NY 10017**

DATA PROCESSING PROFESSIONALS $25-$50K

You've heard the market is tight? New opportunities difficult to find? MY CLIENTS DON'T BELIEVE IT! I represent many of the largest companies in the greater Delaware Valley. I can assure you that if you have at least 3 years of data processing exp. regardless of industry bkgd. you will get serious consideration from my clients. Call or send your resume to

BOB GREENBERG
Vice President
911 Church Rd., Suite 214
Cherry Hill, NJ 08034
(609) 489-0800
(215) 569-3640

position announcements | position announcements | position announcements | position announcements | position announcements

"WE PROMOTE COMPUTER PEOPLE"

INTERVIEW & HIRING COSTS (INCL. RELO.) PAID BY COMPANIES

TOLL-FREE 1(800) 258-7328

Exeter Associates

NATIONAL RECRUITING CONSULTANTS

COMPUTER PARK P.O. BOX 4979
HAMPTON, NEW HAMPSHIRE 03842
(603) 926-6712
A COMPONENT OF EXETER INTERNATIONAL, INC.

HARTFORD

We have specialized in data processing professional placement in Hartford for almost 20 years. If you qualify for positions in the $25-35,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.
One Financial Plaza
Hartford, Connecticut 06103
(203) 525-9037

SENIOR PROGRAMMER-In charge of team of programmers responsible for implementation of programs relating to financial institutions. Analyze & design systems for conversion from manual procedures, as well as enhancement of existing computer systems to ensure efficient operation. B.Sc. or equivalent in Computer Science, Maths. or Physics. Must have knowledge of COBOL, ASSEMBLER & CICS. 4 yrs exp. $32,000 p.a. to work 37½ hrs/5 days/wk. PLEASE SEND RESUMES TO: CAP-CPP Services, Inc. 521 Fifth Avenue New York, NY 10017

Cullinane sales take off!

Cullinane Database Systems, Inc. is pleased to report another year of exciting growth. Our success is simply a natural result of offering the highest user-rated database products in the market. This kind of performance begins with a professional support staff that won't settle for less than excellence.

Naturally, our Technical and Field Support professionals require an environment that is challenging and rewarding. We have been able to honor this need by maintaining a high support to sales ratio. Specifically, that's 1.1:1 in the field and 1.6:1 corporate-wide. As our sales continue to grow, we will be expanding our support staff to maintain a strong market presence and to maximize our future development.

If your professional capabilities deserve an environment of excellence and you have 3 or more years' systems programming experience in an IBM operating environment with strong Assembler and Cobol skills (some previous database and teleprocessing experience highly desirable), we want to meet you! Here are special opportunities in Support right now:

- TECHNICAL • FIELD
- DATABASE
- ON-LINE PRODUCTS
- IDMS/Culprit

Opportunities are available at our Regional Offices in: Philadelphia, New York City, Boston, Chicago, Atlanta, Houston, San Francisco, Los Angeles, and Edison, New Jersey, as well as in our Headquarters in Westwood, MA.

Explore how **Cullinane** will help your career take off. For prompt, confidential consideration, call us today. Or send your resume, specifying geographic preference, to Roy Evarts, Employment Manager, **Cullinane Database Systems, Inc.**, 400 Blue Hill Drive, Westwood, MA 02090, (617) 329-7700.

An Equal Opportunity Employer

Database Systems

Cullinane

INFORMATION SCIENTISTS/ COMPUTER PROFESSIONALS

Excellent Opportunity At: M.I.S. International, Inc.

We're Setting the Standards.

M.I.S. International is in its 12th year of providing systems and applications expertise to Fortune 500 companies and is a leading supplier of computer technology. Exciting software opportunities are available for:

- **REAL TIME PROGRAMERS** - For Robotics Projects, RS X11M or HP1000 required.
- **SR. PROGRAMMERS/ SYSTEMS ANALYSTS** PL1 with manufacturing background (IMS a plus).
- **SR. DATA BASE PROGRAMMERS** - IMS DB/DC with PL1 or COBOL
- **PROGRAMMER ANALYSTS** - IBM OS/ COBOL; TSO/SPF
- **PROGRAMMER ANALYSTS** - DEC PDP 11 RSTSE - BASIC +2 financial applications.
- **SYSTEMS PROGRAMMERS/INTEL 8086**, Experienced in writing Assembler Compilers and relocatable Loaders.
- **PROJECT MANAGER** Manufacturing Systems - PL1 and IMS required.
- **SR. PROGRAMMERS/ SYSTEMS ANALYSTS** Honeywell MULTICS with PL1. Manufacturing a plus

these are salaried positions with M.I.S. International in southeast Michigan. Comprehensive benefits supplemented by outstanding salary and superior working conditions that will prove attractive to the computer professional. Relocation costs provided. Contact **Jim DeNike** or **Marie Clark**.

MIS INTERNATIONAL INC

M.I.S. International, Inc.
Corporate Office
24655 Southfield Rd
Southfield, MI 48075
(313) 552-0550
1-800-521-2144

Equal Opportunity Employer

Production Manager for Computer Services

Ohio University's Department of Computing and Learning Resources is seeking an experienced professional manager for the areas of computer operations, teleprocessing, production scheduling and data entry. The major responsibility is to deliver quality computer support (both on-line and batch) to all elements of the University community-regional campuses as well as the main campus. Current network consists of IBM 370/158, IBM 4341, (2) HP3000's, HP1000, PDP 11/44, VAC 750, 400 Terminals and numerous micro-computers. Qualifications: Degree in Computer Science or related field or equivalent experience. Individual will be required to deal in all facets of computer technology. Salary: $24,000-28,000. Closing date: July 26, 1982. To apply: Please send letter of application and resume to:

Larry Buell, Director
Computing and Learning Resources
Ohio University
Herding Hall
Athens, Ohio 45701

ROBERT QUINN ASSOCIATES
(agency)

An executive search and consulting firm specializing in data technology positions throughout a wide spectrum of industry types is currently seeking qualified individuals to interview for key client positions.

Systems Programmer, 3032, MVS, Rel. 3, JES 2, TSO/SPF ... 35K
Systems Engineer, BSEE or CS Switching Systems Design 48K
Data Base Administrator, IMS DB/DC 48K
Programmer Systems Analyst, HP3000, IMAGE, QUERY . 32K

For detailed information regarding these and other opportunities call or write

ROBERT QUINN ASSOCIATES
P.O. BOX 99612
SAN FRANCISCO, CA 94109
(415) 775-5103

senior systems analyst

FMC's Central Engineering Laboratories is an interactive multi-disciplinary research center chartered to provide consulting services for the Petroleum, Construction, Food and Material Handling Machinery businesses of FMC.

As a Senior Engineering Systems Analyst you will be an in-house consultant, assisting user engineering groups in computer selection, design, evaluation and analysis. You will provide expertise in projects that require advanced application of computer systems and will also evaluate software and hardware for engineering applications.

A B.S. in Mechanical or Electrical Engineering with an advanced degree in computer applications is preferred. You should be experienced with micro-based systems for engineering applications. Experience with VAX 11/780 systems and graphics hardware and software knowledge is an asset.

We offer an excellent salary and benefits package as well as challenging project assignments. For confidential consideration, submit resume, including salary requirements or call: Ms. V. Payne, (408) 289-3433, FMC Corporation, Central Engineering Laboratories, 1185 Coleman Ave., Santa Clara, CA 95052. We are an equal opportunity employer m/f.

FMC

position announcements | position announcements | position announcements | position announcements | position announcements

SENIOR PROGRAMMER ANALYSTS

Discover A Future Where The Best Is Only The Beginning For Higher Achievements.

A small company, a special focus, a spectacular achievement. This is CRAY RESEARCH, developer of today's most advanced supercomputers.

Growing steadily since its founding 10 years ago, Cray's dedication to computer technology and superiority has created an atmosphere in which professionals can achieve greater accomplishments through technical challenge. With our commitment to setting higher performance standards for the future, we need the following individuals to join our team:

SR. PROGRAMMER ANALYST — Technical Support
As Sr. Technical Support Software Specialist working out of our central support group in Minneapolis/St. Paul, you would be on-call for software problems escalated to headquarters support. Expect 50% travel, both overseas and in the U.S. At least 6 years large scale operating systems internal experience is required, and on-site analyst and/or software development experience is a plus.

SR. PROGRAMMER ANALYSTS — Software Development
This new group is responsible for developing software for the new exciting supercomputer. We seek individuals with software experience on large scale computers, preferably multi-processor background. In order to meet critical deadlines, openings for people with 3 to 5 years experience exist in the following areas:

LIBRARIES — optimize assembly language routines in math and I/O libraries. Strong mathematics background is necessary.

FORTRAN COMPILER — to work on team that will convert a highly optimizing compiler for our new computer.

OPERATING SYSTEMS — develop interactive operating systems utilizing a multi-processor architecture.

Discover Cray, where abilities make a visible difference because we believe ideas should be heard and tried — a belief that has made us the benchmark of the large scale computer industry. You'll find excellent career development programs and the opportunity to pursue your ideals and goals for achievement. The Minneapolis/St. Paul area is the perfect complement to Cray with its many educational, cultural and recreational advantages.

For immediate consideration, send your resume to:

John C. Borchers
Department 712
CRAY RESEARCH INC.
1440 Northland Drive
St. Paul, MN 55120

The Supercomputer People

CRAY RESEARCH INC

An Equal Opportunity Employer M/F/H/V

COMPUTER MAPPING LEAD APPLICATIONS ANALYST/PROGRAMMER

SALARY $27,123 - 36,629 Annually

Conducts technical and financial studies, acts as a project leader in development and maintenance of complex computer applications involving municipal functions such as land use, zoning and real property records maintenance. 3 years applications analyst or analyst/programmer experience and degree in computer science or related field. Ideal candidate would have experience with automated mapping systems. Familiarity with municipal functions is desirable and working knowledge of FORTRAN and familiarity with DEC PDP11 series computers is preferred.

CITY OF PHOENIX

Personnel Department
10 N. Third Ave.
Phoenix, Arizona 85003

NEW START-UP OPPORTUNITIES

Having a difficult time deciding where to send your resume? Fox-Morris specializes in the placement of all programmers & systems analysts. We work primarily with TOP FORTUNE 500 Companies throughout the S.E. with special emphasis on new START-UP opportunities. For a clear understanding of our clients' needs write or call Robert Montgomery at 919/872-2940. All fee paid positions. No obligations.

FOX-MORRIS
Personnel Consultants
Since 1962
3101 Poplarwood Court
Raleigh, NC 27625

EDP AUDITOR

New Mexico's newest Bank Holding Company seeks qualified individual to fulfill EDP Auditor responsibilities. In depth knowledge of data processing operations, COBOL programming, IBM 4300 hardware, and DOS operating systems a must. Financial or EDP Auditing experience a definite plus. Salary commensurate with skills and experience. Position offers a full range of benefits including a profit sharing plan and stock options. Direct resume to Robert L. Gossard, Auditor, First City Financial Corporation, P.O. Box 3366, Albuquerque, NM 87190, or call, (505) 888-8888.

An Equal Opportunity Employer M/F

POSITIONS WANTED

PROJECT LEADER

with 11 Years of MIS experience seeking overseas position. Resume and references supplied upon request. Married status position only.

Reply to CW-A3288
Computerworld
Box 880
Framingham, MA 01701

COMPUTERWORLD CLASSIFIEDS--

--PROGRAMMED TO HELP YOU.

The computer industry is dedicated to developing greater efficiency and valuable time-saving resources for the business world.

Well, so are ***Computerworld Classifieds.***

With 114,408 paid subscribers and a pass-along readership of 425,598, Computerworld can bring your advertisement to a potential audience of more than half a million readers. Along with that comes a greater chance of substantial reader response and a solution to your particular problem.

And we can deal with a lot of problems. Our classifications include:

Position Announcements -- To help you find the computer professionals right for you.

Positions Wanted -- For individuals seeking full-time, permanent positions-no company ads are allowed.

Buy, Sell, Swap -- For those seeking to buy, sell or lease computer equipment.

Time & Services -- For companies who want to offer computer timesharing or other computer-related services.

Software for Sale & Software Wanted -- Used for buying & selling software packages.

Business Opportunities -- For those seeking individuals or partners in computer-related business ventures, mergers, or franchises.

Real Estate -- For those seeking to sell or lease office space suitable for computer rooms or computerized businesses.

Bids & Proposals -- Used to request for bids on equipment or to invite proposals for desired computer acquisitions.

The Computerworld Bulletin Board -- Our newest addition to the classified pages of Computerworld, this is a low-cost way to buy or sell individual pieces of hardware or software. See below for details on sizes and cost.

Here's the data you need to know to place your ad:

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

Our ad takers will be happy to take smaller sized ads over the phone. We can provide simple line borders for you, if desired.

We also provide telecopier service at extensions 410 and 451.

The open line rate is $6.95 per line and there is a minimum size ad of 2 column inches (28 lines) at a cost of $194.60. Column inches are calculated by multiplying the number of columns wide by the number of inches deep your ad is. Depth increases in half-inch increments and we accomodate up to 5 columns. Column widths are as follows:

1 column--1 13/16" or 11 picas
2 columns--3 13/16" or 23 picas
3 columns--5 13/16" or 35 picas
4 columns--7 13/16" or 47 picas
5 columns--9 13/16" or 59 picas

If you wish a box number to be assigned to your ad, it will cost an additional $10.00.

First-time advertisers must send payment along with their ad.

For the ***Computerworld Bulletin Board***, ads may be sent by mail, by telecopier or given over the phone. Space is available in ***one column by one inch deep units only.*** They are set up using a ***simple format with standard typefaces and no borders or logos are allowed.*** The cost of one standard unit is ***$99.00.*** These units may be combined to form deeper ads.

So, whatever the problem, simply supply us with the data we need to help you on your way to a solution, quickly and efficiently.

If you would like more information, or wish to reserve space, call our office nearest you:

Boston - (617) 879-0700 or
1-800-343-6474
New York - (201) 967-1350
San Francisco - (415) 421-7330
Chicago - (312) 827-4433
Los Angeles - (714) 556-6480

William J. Mills, Classified Advertising Manager

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY SELL SWAP

DPD PERIPHERALS

3330 3410
3340 3411
3350 3420

BUY • SELL • LEASE

COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE

CB

901-372-2622

GSD SYSTEMS

3 32
34 38

BUY • SELL • LEASE

ASCO

PCM

Pioneer Computer Marketing
214/385-0354

BUY-SELL LEASE
- All IBM Systems
- Peripherals
- Tapes
- Disks

SERIES/1
- Systems
- Features
- Peripherals

SYSTEM 34
- CPU
- Peripherals
- Upgrades

PIONEER COMPUTER MARKETING
Suite 680 4835 LBJ Frwy
Dallas, Texas 75234
214/385-0354

HOW TO GET THE 3081 YOU NEED NOW... NOW.

Talk to Randolph now. We can solve problems like these, and more . . .
Long wait for delivery?
We can improve your delivery position by as much as a year
Stuck with a lease on your old machine?
We'll sublease it, and provide a new lease on a 3081
Own a 3081 but need cash?
Sell the machine to Randolph, and we'll lease it back to you
Machine installed on a rental or lease basis?
We'll show you how to end the lease and install a new 3081 Any termination charges can be folded into your new Randolph 3081 lease

SAVE $80,000 EVERY MONTH FOR THE NEXT 5 YEARS.

You can lease the same 3081 that IBM rents for $180,000 per month from Randolph for less than $100,000 per month. If you're renting an older machine, we can save you even more—and you'll get about 4 times the throughput in the bargain

WHEN IS THE BEST TIME TO TALK TO RANDOLPH ABOUT LEASING A 3081?

The sooner the better. But it's never too late, even if you already have a machine installed. Whatever your problem, we can tailor a lease that will fit your exact needs and let you start saving money right away

LEASING COMPUTERS IS OUR ONLY BUSINESS.

At Randolph, our people have an average of 18 years in the DP industry from 360's to 3081's. They know all about alternative financing to be sure but they also know their way around a DP department and the hardware in it

WE LEASE MORE THAN 3081's.

Whatever your needs now is the time to talk to Randolph We provide leases for IBM 303X, 4300 systems and peripherals—disks tapes—as well as 3081's

UNIQUE FINANCIAL STABILITY.

We're an important part of one of the nation's oldest and leading banking institutions The First National Bank of Boston 18 years in computer leasing gives added assurance that Randolph will continue as the leader in the computer leasing industry continue to live up to the terms and conditions of our agreements provide upgrades fulfill all of our commitments

LET RANDOLPH HELP YOU GET THE 3081 YOU NEED TODAY.

We can solve a lot of problems for you Talk to Randolph now call Joseph B Kelly Jr. Senior Vice President

537 Steamboat Road
Greenwich Connecticut 06830
203 661-4200 • 800 243-5307

Randolph

BANK of BOSTON

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION RANDOLPH COMPUTER COMPANY A subsidiary of THE FIRST NATIONAL BANK OF BOSTON

TCR

BUY SELL LEASE
IBM
SYSTEMS 3, 32, 34, 38 and PERIPHERALS.
30-Day Availability

5251	5211	5256	3262	1403	3525
3741	3742	3276	3277	3278	3505
3410	3411	3340	3344	029/129	

Buy/Sell Used Decision Data Products

FEDERAL COMPUTER MARKETING, INC.
14001 Goldmark Drive, Suite 237
Dallas, Texas 75240 (214) 690-5187

DATA GENERAL

Hanson Data Systems

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

DEC*
PDP
11/24-BC
Large box CPU
with PAX option
New — In Stock
SAVE$ SAVE$
800-854-0350
IN CALIF 714-632-6986
* Reg. Trademark Digital Equipment Corp.

GREYHOUND MEANS COMPUTER LEASING IN ANY LANGUAGE.

Today, Greyhound Computer Overseas Corporation, one of the largest and most experienced computer leasing firms in the business, can meet your computer equipment requirements almost anywhere in the world.

We have a large portfolio of IBM computer equipment. And we have the financial strength to be able to lease, buy, sell, trade, purchase/leaseback or structure a leveraged lease for you.

Our Agents, Representatives and Affiliates throughout the free world may be contacted through our principal offices or our Dallas headquarters.

For your non-IBM equipment needs, domestic or worldwide, contact Don Haworth or John Hallmark in Dallas.

DALLAS (Hq.)
Greyhound Computer Overseas Corporation
4101 McEwen Road
Suite 174
Dallas, Texas 75234
(214) 233-1818
Telex: 163177 GCOC UT
(via TRT) 794500
GCOC FABR
TWX 9108605500
GCOC FABR

ENGLAND
Greyhound Computer (U.K.) Limited
Regal House – 7th Fl.
London Road
Twickenham
Middlesex TW1 3QS
England
44.1.891.4986-88
Telex: 851291329
GHCOMP G

FRANCE
Greyhound Computer France S.A.
77 rue la Boetie
75008 Paris
France
33.1.256.3364-65
33.1.261.5107 X 363
Telex: 842642144
GREYHFR

GERMANY
Greyhound Computer Deutschland G.m.b.H
Rottenbucherstrasse 32
8032 Graefelfing
West Germany
49.89.85.10.59
Telex: 841524168
GREYHD

MEXICO
Greyhound Computer de Mexico, S.A. de C.V.
Bosque de Duraznos
69-1106
Bosques de las Lomas
Mexico 10, D.F.
Mexico
905-596-4457
905-596-4860
Telex: 3831776414
CAVAME

SWITZERLAND
Greyhound Computer, S.A.
1, Place de la Gare
1260 Nyon
Switzerland
41.22.61.27.54
Telex: 84527786
GREYD CH

GREYHOUND COMPUTER OVERSEAS CORPORATION
(214) 233-1818
A subsidiary of Greyhound Computer Corporation

Call Us First or Last
But Call Us For Sure!

Buying • Selling • Leasing

IBM Systems & Peripherals

System 3
System 32
System 34

5110 • 5120

5251 (011 & 012's)
3741 • 3742
029 • 129

For Sale
System 34's
Any Configuration
Wanted
5251 Models 11 & 12
5256 Model 3's
System 34-D34 August
Jim Kelley
Coastal Computer Marketing
(213) 986-4830
CDLA

11/23+
New with RL02's
CTS-300, CTS-500
or RSX
30% Off
Call Ralph Gordon
1-800-354-9206

BUY • SELL • TRADE
DEC DG CDC
ALL FOR OUR
MONTHLY SPECIALS

We Buy & Sell
DEC
Systems
Components
Digital
Computer
Resale
call:713
445-0082
600 Kendick Ste C22
Houston, Tx 77080

PERIDATA INTERNATIONAL

DEC COMPATIBLE SUB-SYSTEMS

CDC9448-32
CDC9448-64
CDC9448-96
CDC9730-80
CDC9730-160
CDC9762
CDC9766

New in Manufacturer's Box.
* Available from Stock at Competitive Prices.

213-827-1022

→ NCR USERS
Are You Thinking of Trading Up ↑ ? or Down ↓ ?
Call Us for a Quote
SMITH ANDERSON CORP.
714-340-6688
Authorized NCR Systems
Distributor – Nationwide
(New or Used Systems)
71-886 Highway 111
Rancho Mirage, Calif. 92270

Dearborn Giveth
Attractive Lease Rates
Available

dc dearborn
Call Earl Jacobson
(312) 827-9200

FOR SALE

Dale Hauger
or Charles Berry
MAJOR COMPUTER
INCORPORATED
CDLA 612 933 6000

DEC SYSTEMS
Software support, complete installation
Immediate delivery on
11/780, 11/750, 11/70, 11/44, 11/24, 11/23
New & used disk & tapes
RM05, RP06, RM03, RM02, TS11, TU77
Non DEC peripherals, CDC, Kennedy, Emulex
Terminals and options
VT-100, LA120, DZ11, FP11's, DUP11's
Call (408) 738-3368
IDS International data services
1020 Stewart Drive
Sunnyvale, CA 94086 TWX 172-189
Buy & Sell

1-800-433-4148
ALL
IBM
Systems [illegible] Upgrades
S/32, S/34, S/38, S/[illegible], [illegible] 4300s
CALL US NOW TOLL FREE!!
DANA MARKETING, INC.
In California Call (213) 372-8845
P.O. Box 3021
Redondo Beach
California 90277

WANTED TO BUY
IBM SYSTEM 35
Model E35 with 2500/3701, (128K, 128.4 MB), four (4) 5251 display stations with 2680 and 4600, 3262-B1 printer. We will take immediate delivery, will consider larger equipment but not smaller, be prepared to quote firm price. For immediate consideration please send equipment list and price quotes or call FINANCIAL SOFTWARE OF AMERICA, P.O. Box 2084, Winter Park, FL 32790 (305) 645-3724.

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY
SELL • LEASE

DISK
3340 • 3344
3350 • 3380
TAPE
3411 • 3410
3420

Call Bob Ford
or Nelson Johnson

S/38
S/34
S/3
SERIES/1

Call Gayle Drotar
Roger Odom
Ken Winzen
John Bottom

370 Systems

4341 • 4331
3031 • 3032
3033 • 3081

Call Jack Harvey
or Larry Nesbit

NEED TO REDUCE EXPENSES?
ECONOCOM'S PURCHASE-LEASEBACK PROGRAM CAN PRODUCE IMMEDIATE SAVINGS ON YOUR PRESENT EQUIPMENT—CALL FOR DETAILS.

ECONOCOM
1755 Lynnfield Road
PO Box 17825
Memphis, Tennessee 38117
901-767-9130

SAVE 10 TO 24% OFF MLC

SPECIAL LEASE RATES ON NEW SYSTEM/38s

- MODEL 5 & MODEL 7 ONLY
- OPTION TO RENEW—MO./MO
- OPTION TO PURCHASE (FIXED)
- SYSTEM MUST BE INSTALLED NOT LATER THAN @ 31-82

CALL FOR DETAILS:
901-767-9130

ECONOCOM
P O Box 17825 / 1755 Lynnfield Road
Memphis, Tennessee 38117-8825

COMDISCO

Your First Choice ☑
In The Second Market

IBM PROCESSORS

3081 Available Trade-In Kit Available Early
3033 Available Now Not Short Term
3032 Available Now Not Short Term
3031 Available Now Not Short Term
4341 Buy Sale Lease
All 370's Immediate Availability Sale Month To Month Leases
Amdahl Short Term Sub-leases Available
Memory Channels Full Array Made Immediate Available

IBM PERIPHERALS

3880-1/3830-2 Immediate Availability
3350/70/75 Immediate Availability
3880-2/3880-3 3-45 Day Availability
3380 A4/AA4 3-45 Day Availability
3380 B4
3330/40/44 Immediate Availability
3803-1/2 Immediate Availability
3420's
3705/04 Call Karen
327X CRTS Call John Christopher 312-698-30

We Can Put It Together

Eastern Regional Headquarter
Midwestern Regional Headquarters
Western Regional Headquarters
South Central Regional Headquarter
Canadian Regional Headquarter
International Headquarter
Corporate Headquarter

A MEMBER OF CDLA AND LISTED ON THE NEW YORK STOCK EXCHANGE

IBM UNIT RECORD EQUIPMENT
DISK PACKS, DATA MODULES, MAG. TAPE, DISKETTES

SALE OR LEASE

026	084	129	546	2316
029	085	514	555	3336(1)
082	087	519	3742	3336(11)
083	088	526	360/20	3348(70)
				Cartridges

Highest prices paid for used packs & machines.

Thomas Computer Corporation
600 North McClurg Court, Chicago, IL 60611
800-621-3906 ■ 312-944-1401

Authorized Distributor Memorex CDC 3M BASF

We Buy • Sell • and Lease IBM

3741/3742
- All Models
- Printers (3715 & 3717)
- Many in Stock
- Short Term Leases/Rentals
- Purchase/Leaseback

• CPU's • CRT's • Printers •

Call BARRY TESSLER
PEARL EQUIPMENT COMPANY, INC.
P.O. BOX 24026 • 4717 CENTENNIAL BLVD
Nashville, Tn. 37202 (615)383-8703

Pearl EQUIPMENT CO. INC

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

*** * * * DEC * * * ***

BUY—SELL—LEASE—TRADE—CONSIGN

— CPU'S —
11/23 11/34A 11/44 11/45 11/70 11/750

— DISCS —
RK05 RL01 RL02 RM02 RM03
RP04 RP05 RP06 RK06 RK07

— TAPES —
TM11EA TE16 TWE16 TJU45 TU45

— MEMORY —

11/34	11/44	11/45	11/70	VAX
MS11JP	MS11MB	MM11UP	MJ11BE	MS750
MS11LB		MF11UP	MK11BE	MS780
MS11LD			MK11CE	

— MISC. —

FP11A	FP11B	FP11C	FP11E	FP780
DMC11AL	DMC11AR	DMC11MD	DMC11DA	DMR11
DJ11AA	DJ11AC	DH11AA	DH11AD	DQ11
DV11	DZ11	DU11	DL11	DR11
RH780	RH70	RH11	KK11	RK611

THOUSANDS OF MODULES IN STOCK
SPARE FOR ANY DEC UNIT
CALL FOR QUOTE

* * * * NEW CONSIGNMENTS * * * *
SUPER PRICES

11/34A	11/45	11/45
256KB	3-RK05	Dual RP03
Dual RK07	TM11	TM11
VT100	LA36	LA36

NATIONAL COMPUTER EXCHANGE

800-854-7224

6980 Aragon Circle, Suite 5 • Buena Park, CA 90620

(In Calif.) 714-522-1870 TWX:910-596-1499

SYSTEMS • PERIPHERALS • PARTS

DG | DEC

NEW PHONE NUMBERS

Phil Thomas 305-392-2006

Bryan Eustace 305-392-2005

Jennifer Eustace 305-392-2007 TELEX 807-219

BUY - SELL - TRADE - LEASE

THOMAS BUSINESS SYSTEMS, INC.

DEC

SYSTEMS & COMPONENTS

C.D. SMITH & ASSOCIATES, INC.
12605 E. Freeway,
Suite 318
Houston, TX 77015
713-468-2384
TELEX 76-2547 CDSMITH HOU

SERIES/1

SPECIAL — THIS WEEK

4955 D Processor 64K $5,000

FRONTIER

Buy - Sell - Lease

IBM

S/32
S/34
S/38

3741
3742

CPU's CRT's PRINTERS
ALL MODELS

PURCHASE/LEASEBACK
SHORT & LONG TERM LEASES

Computer Marketing of America, Inc.

P.O. Box 90007
422 Ashlee Park Drive
Nashville, Tennessee 37209

Call: Steve Hough or Dick Geyer

1-800-251-2670

In Tennessee: 615-297-7516

Nation's Largest Dealer of used
MICRODATA
Equipment

BUY • SELL • TRADE

CALL COLLECT
(206) 852-2045

COMPUTER WHOLESALERS

11/70

DEC* MK11-CA

MOS BOX & 512KB

CORE to MOS

CONVERT NOW
AND SAVE $10,000

LIST ~~$24,600~~

NOW $14,600

800-854-0350

IN CALIF 714-632-6986

* Reg. Trademark Digital Equipment Corp.

WANTED TO BUY

IBM 370/158-3 U38 (All IBM CORE)
1433, 1434, 1435, 2150, 2151
3700, 3950, 4650, 6111, 7840, 9318
HARRIS 8170 CRT's & Controllers
MEMOREX 365X DISK DRIVES

Don Holsinger
Virginia Farm Bureau Mutual Ins. Co.
Box 27552
Richmond, Va. 23261 (804) 768-1234

4341
4331

4341-K1 (used) will reconfigure to L1 or L2
Available 11/1/82
Sale / Lease

Tape Drives
3420
3410 8809
Immediate Delivery

Controllers
3880 3830
3803
Immediate Delivery

DASD
3380 3375 3370
3350 3344 3340
3330 3310
Immediate Delivery

Printers
3203 3211
1403
3287 3289
Immediate Delivery

Control Units
3274 3272
3276 3271
Immediate Delivery

We Buy Sell & Lease IBM Processors and Peripheral Equipment

Display Stations
3278 3277
Immediate Delivery

CDLA

Contact Bernie Best 215 782 1040

Computer Marketing Inc.

2704 Sentinella Ave. Philadelphia PA 19125

Office Systems Company

Owner states $384,000 cash flow last year for this reputable office equipment company in large Midwestern town. Company offers sales and service on computers, office equipment, copy machines, typewriters, plus carries several lines of office furniture. Comes with $250,000 worth of inventory plus $125,000 in accounts receivable. 5,500-sq. ft. main building plus new 5,300-sq. ft. service and warehouse building. 3 colleges in city. $2,250,000, $750,000 down, long-term owner financing at 10% annual percentage rate.

Contact: Dennis Crull
United Farm Agency
812-KC W. 47th St.
Kansas City, MO 64112
Ph. Toll Free: 1-800-821-2900

FOR SALE

WANG OIS-140-1 (26.8MB DISK)

WORD PROCESSING-LIST PROCESSING
MANAGEMENT STATISTICS SOFTWARE

- *Four* 48K Workstations
- *Two* 48K Archiving Workstations
- *Two* 6581W Wang Daisy Printers
- *One* 5581WD Twin Head Printer

Available October 1, 1982
Contact Irv Walters, Motorola Government Electronics Group, P.O. Box 1417, Scottsdale, AZ 85252
602/949-2997

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

3081 Memory Available D & K Systems Lease Financing for Your Systems or Ours

3033 Upgrades S-N to N-U Memory/Channels

3033-N Short Term Lease

3033-U Short Term Lease

3042 Short Term Lease

SYSTEM 3 Models 12 and 15 Dennis Pennington

AMDAHL V6II - V7 - V8 Sale or Lease

3168 Upgrades Memory/Channels/Features

30-60 DAY DELIVERY 4341-M2 Sale or Lease Below IBM Rates

Wanted 4341-L01 Call Now

Communications IBM 3705 IBM 3704 Pat Ducey

SYSTEM 34 SYSTEM 32 Dennis Pennington

3270

3350 3340 3375 3360 3370 3830 3330 3380 Buy/Sell/Lease Pat Callahan Mary Drangin

2914 3203 3600 3505/3525 3211/3611 Mary Drangin 3803/3420 Immediate Delivery Tim Ryan

MARKETING
California (408) 773-1614 (415) 956-3183 (714) 752-8443
New Jersey (609) 645-7282
Tennessee (615) 449-6633
Texas (214) 385-0806
Montreal, Quebec (514) 871-1121
Paris, France Telex: 613910 CMI FR
Windsor, Ontario (519) 258-8910

CMI CORPORATION
755 W. Big Beaver 19th Floor Troy Michigan 48084
TWX TELEX 810 232 1667 CMI CORP TRMI
(313) 362-1000

CMI FINANCIAL SERVICES, INC.
755 W. Big Beaver, Troy, Mich 48084
(313) 362-1000

Member CDLA

BROOKVALE DEC

LEASE•SELL•RENT•UPGRADE

PDP 8, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/45, 11/60, 11/70, VAX/750, VAX/780

SYSTEMS•OPTIONS•SUPPLIES

Brand New Systems, Fully Warranteed. In Stock!

11/23	128Kb MOS, dual RL02, RSX11-M	$16,575
11/44	256Kb MOS, dual RL02, LA120, RSX11-M	$34,950
11/750	512Kb MOS, dual RK07, DZ11A, LA38 VMS, full support	CALL
11/34A	256Kb MOS, dual RL02, DD11-DK, LA120, RSX11-M	$25,850

Other Systems Available - Call For Details

BROOKVALE ASSOCIATES
(800) 645-1167 • NEW YORK (516) 567-7777
40 ORVILLE DRIVE • BOHEMIA, NEW YORK 11716

TO: IBM COMPUTER USERS— SYSTEM 3, 34, 38.

FROM ANYLEX LEASING CORP.

RE. LEASE FINANCING (Hardware and Software). EQUIPMENT ACQUISITIONS. DATA COMMUNICATIONS.

If you have a computer system or you are considering acquiring a computer system, you owe it to yourself to call ANYLEX

From private placements to conditional sales, our leasing program is designed with our client's requirements in mind

Our expertise is in IBM—GSD products and lease packages. We are ready to assist you in any related aspect of your installation.

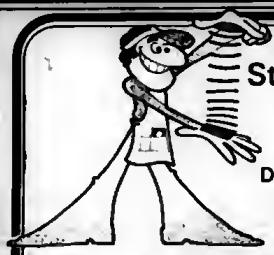
Please call if we can be of any service to you

ANYLEX LEASING CORPORATION
1001 Ave. of the Americas
New York, New York 10018
(212) 719-9205

asca

We are members of the American Association of Equipment Lessors and the American Society of Computer Dealers

---



Stack your DEC with WEX

DEC specialists with exciting deals

11/34A-ZC

While supply lasts
PDP 11/34A
5¼" chassis
256KB MOS Memory
Bootstrap
Terminator

$5,500.00
List $15,900

CALL US !!

• • ASK FOR OUR COMPLETE DEC CATALOG • •

WEX West Coast Computer Exchange Inc.
11309 Folsom Blvd Rancho Cordova, CA 95670
TWX # 910-367-3787
(916) 635 - 9340

BUY...SELL...LEASE

IBM SYSTEM/34

Save up to 40%

F37 E35
D34 C23

5251 CRT's
5256; 5211

Fraxions EQUIPMENT CORPORATION
(212)279-0069

DATA GENERAL SPECIALISTS FOR Surplus New & Used Equipment & Systems with full depot repair facilities.

CALL US
WE TAKE THE TIME.
- WE CARE -

JM Associates
601 W. Chapel Avenue
Cherry Hill, NJ 08002
609-663-1115

Buy • Sell • Lease

New & Used Equipment

SYSTEMS DEC PERIPHERALS

CPUs 11/34 11/44 11/70

DISCS RP04 RP06 RM02 RK06 RL01

TAPES TE10 TU45

TERMINALS LA36 LA120 LA180 VT100

BAI

Carl R. Boehme & Assoc., Inc.
SPECIALISTS IN DIGITAL ENGINEERING
Phone (408) 727-2666 Telex 172157

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY SELL LEASE
Series 1
Peripherals & Features
Systems 32-34 38

Various Items of Unit Record Equipment

BEDFORD COMPUTER MARKETING, INC.
4141A Greenbriar
Stafford TX 77477
Tel (713)491-8757

"THE BEST OPTION"
COT
COMPUTER OPTIONS, INC.
612-544-8660
800-328-5718

BUY • SELL • LEASE
SERIES/1
(Systems and Peripherals In Stock)

"THE BEST OPTION"
COT
Computer Options, Inc.
1660 S. Hwy. 100 #428W
Minneapolis, MN 55416
612-544-8660
800-328-5718

BUY • SELL • LEASE
S/34
S/38
ALSO
S/32, S/3, S/23
DASD
3340 3410
3344 3411
3350 3420

FOR SALE
PDP 11/44
100% DEC
512KB
(3) RK07 Disk Drives
1 PS11 Tape Drives
1 LP11 Printer
Software Included:
RSTS/E, Word Processing, A/R, A/P, Order Entry, Invoicing, Inventory Control, P O System, Job Costing, General Ledger.
50% Off List
CALL DON TURNER
(614)272-0202

BURROUGHS
TD830 CRT's
B1855 Complete Systems
B4890 CPU
B950 Complete Systems
B9246-20 2000 LPM printer
Complete tape subsystems
BSI
7480 W. Alameda Ave.
Denver Colorado 80223
(303) 922-8331
Telex 910-931-0483

For Sale By User
New DEC VAX 11/780
With Warranty
(1) SV-AXDCA-CA
(1) MS 780-DC
(2) RM05-AA
COBOL, FMS, DATATRIEVE
With Full Support
(PLUS MORE)
Discounts Available
Please Call
Mike Wolfe or Joe Macrell
DJC Corp.
2049 Century Park East, Ste. 3000
Los Angeles, CA 90067
(213) 277-4562

DEC
Check out our unbeatable combination - huge inventory at the lowest prices anywhere!
Call toll free 800-328-7000
In Minnesota (612) 894-4020
MSI MIDWEST SYSTEMS, INC.
12417 Riverwood Dr. • Burnsville, Minnesota 55337

For Sale
(A) 37.5 KVA ATLAS Motor Generator, 208 Volt 3 Phase 60 Cycle.
(B) 5 Ton Liebert Challenger Upflow Air Conditioner.
Both units ideal for mini-computer use.
For Sale Due to Expansion
Call Steve Moss
(212) 766-1330

FOR SALE
4341-M2
3278- A2
Available Immediately!
Call 214/258-0541
MCC METROPLEX COMPUTER COMPANY, INC.
320 Decker Drive • Suite 780
Irving TX 75062

1 Year 2 Year
3 Year Lease

3033U16	Now
3033N12	8/15
3033S12	Now
3420-6's	Now
3803-2 1792 8100	Now
8420-7	Now
3033U12 To U16 Memory	Now

Call:
Charlie Albright
Sha-Li Leasing Associates
(212) 742-2241
39 Broadway
New York, NY 10006

IBM 1288
Optical Page Reader
w/ hand printed feature
RPQ AA 4177 Installed
MUST SELL
Detroit Ball Bearing Company
(313) 963-6011

IBM 3370 DASD IBM 3083/B16
NEW
IMMEDIATE SHIPMENT
SALE OR LEASE
SHIPS MAY 1983
LEASE ONLY
PLEASE CALL (312)943-3770
FORSYTHE MCARTHUR ASSOCIATES, INC.
919 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60611

AUSTRALIA
System House seeks software packages for resale
CONTACT
Ian Hopkins
Hopkins Noble Pty Ltd
24 Albert Road
SOUTH MELBOURNE, AUST., 3205
Phone: 03 690 6877
Telex: AA39429

SELL DENNISON SELL
INTACS 2300 PRINTER
Almost new dot matrix printer excellent for specialized printing needs.
Features:
•Variable test size & orientation
•Bar Code capability
•Pin Feed
•RS 232 interface
Asking $6000
Call
VICON INDUSTRIES, INC.
(516) 293-2077

For Sale Or Lease
Available Now
Call Diane Prestigomo
Leasing Dynamics, Inc.
1717 East Ninth Street
Cleveland, OH 44114
(216) 687 0100

DEC SWA South West Automation DEC
BUY, SELL, LEASE, TRADE
11/03-23-24-34-44-70
Systems-Peripherals-Modules
Maintenance-On Call Or Contract
Time Sharing, A/P, A/R, GL, INV, Payroll, WP
11381 Meadowglen, Suite E
Houston, TX 77082
(713) 497-4467

FOR SALE
DEC DISK DRIVES
(3) RP06-AA Drives
One Year Old
Under
DEC Maintenance
Available Now
$14,000
(617) 777-4666

DATA PROCESSING
1 Burroughs 18400, Paper tape i/o, 3 Casette station, 14KB memory. 1 Burroughs 18800, 30 CPS, 3 Cassette station, 14KB memory. Good condition. Reasonably priced. Call Robert Staz at Brookwood Farms (717) 233-6423.

NEW • • • USED
WE WILL NOT BE UNDERSOLD
TERMINALS, CRT's, PRINTERS
ADDS • NEC • DEC • QUME • DIABLO • TELEVIDEO • HAZELTINE • TEXAS INSTRUMENTS
Specialists In All DEC And T.I. Systems and Components
SPECIALS

VT100AA s, Used (19)	$1,019
Delta 630KSR s, New	$2,395
TI 745 s, New	$1,350
TI 630KSR s, New	$1,895
Alan 800 s New	$675
LA120AA's, New	$1,675
Qume, Adds, TI (All)	To 25% Discount

THE COMPUTER BANK
310 Walt Whitman Rd.,
Huntington Station, New York 11746
(516) 549-5890

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

168-U38

W/7730, 3855 etc.

SHORT TERM or SELL AVAILABLE NOW

WANTED

4341-K1

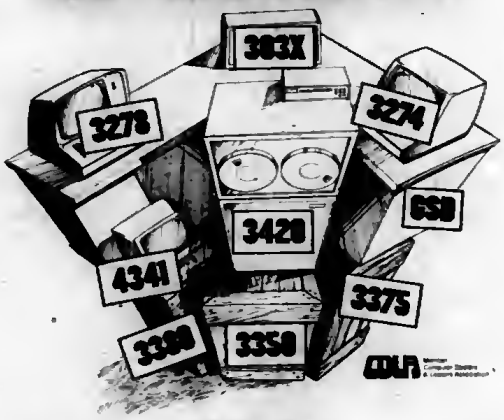
4331-1 or 2

ALL SIZES & FEATURES IMMEDIATE SHIP

CALL or WRITE:
TED ARBUCKLE or
TERREE KELLEY
1-800-528-0422

GREYHOUND COMPUTER CORP.
GREYHOUND TOWER, 1415
PHOENIX, AZ 85077

THE HARDWAREHOUSE IS HARD TO BEAT FOR PRICE AND AVAILABILITY.



Call Us Collect

UNITED STATES	
Boston: Eastern Regional Headquarters	**(617) 272-8110**
Washington, D.C.	(703) 521-0300
New York	(212) 832-2622
Philadelphia	(215) 293-0546
Syracuse	(315) 682-6120
Austin: Southern Regional Headquarters	**(512) 451-0121**
Atlanta	(404) 768-6535
Dallas	(214) 233-1818
Houston	(713) 629-4440
Chicago: Central Regional Headquarters	**(312) 780-9100**
Pittsburgh	(412) 922-8920
Detroit	(313) 995-8717
San Francisco: Western Regional Headquarters	**(415) 283-8980**
Los Angeles	(213) 670-7994
Denver	(303) 534-7436
San Diego	(714) 231-2361
Seattle	(206) 447-1682
Phoenix	(602) 248-5978
Portland	(503) 228-7033
CANADA: Toronto	**(416) 366-1513**
Montreal	(514) 281-1925

BROKER/DEALER SALES AND LEASING
Phoenix: (602) 248-6848

168, 383X, 155, 158	**Ted Arbuckle**
Memory	**Sandy Mitchell**
Peripherals	**Dave Revere**
Communications & Terminals	**George Beck**
GSD & 360	**Phil Iversen or Wayne U. Smith**
Leverage Leasing	

GREYHOUND COMPUTER CORPORATION
Greyhound Tower Phoenix, Arizona 85077, 800-528-6113

FOR SALE
NCR-151
Computer

(1) 7112 192K MOS Memory Unit
(2) 657-102 Dual disc unit 120 MB
(1) 6102 Thermal I/O writer
(1) 6004 Extended addressing logic
(1) 6011 Common trunks 1 & 6
(1) 682-101 Card reader 300 CPM
(1) 640-101 Line printer 450 LPM
(1) 625-201 Disc controller
(1) 6002 Integrated multiplexor
(1) 693-600 Synch adapters (2)
(1) 625-200-F001 dual density
(4) 692-600 Asynch adapters (8)
(1) Logic command unit
(1) Multi-programming feature

Terminals

(8) Series 500 CRTS (TEC)

Norand Micro-Computers

(4) 64K Eprom briefcase computer
(4) Two-way acoustic couplers
(4) A.C. battery chargers

Disc Packs

(42)657 Disc packs

For Information contact:
Stan Pedzinski
(918) 622-1600

BUY SELL
IBM

SERIES/1
5110-5120
S/32
S/34
S/38
S/3

ALL MODELS
SYSTEMS AND PERIPHERALS
AVAILABLE **NOW!**
(408) 425-7333

SOURCE
DATA PRODUCTS, INC

Inflation Fighters

Quality & Savings

Slightly used Money Back Guarantee Full Reels All External Labels Removed Guaranteed for use at 800 BPI through 6250 BPI

2400' Reel	$4.95 ea
1200' Reel	$4.25 ea.
600' Reel	$3.50 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes
All orders shipped within 48 hours
Call or Write
Computer Tape Mart
169 B New Highway
Amityville, New York 11701
(516) 842-8512

Used IBM 4341/L2
(4 Meg - Group 2)

Available Now
Sale or Lease

[illegible]
Eugene M. Arnold
Associates, Inc.
[illegible] North Michigan Avenue
Chicago, Illinois [illegible]

IBM
SERIES 1 S/32 S/34 S/38
TAPE DISK PERIPHERALS
UNIT RECORD 029-129
5110-5120 3741 3742

Amerilax Computer Corporation

214-934-9151
GENE NICHOLL TOM KLEERSCH
14229 PROTON • DALLAS, TEXAS 75234

617-272-8146

Alternative
wang
Specialists
WORD PROCESSORS OIS COMPUTER SYSTEMS

SYSTEMS & PERIPHERALS

- BOUGHT
- SOLD
- SERVICE
- UPGRADES
- TRADE-INS
- LEASES

and we're faster!

CFR
CFR ASSOCIATES, INC.
18 GRANITE STREET
HAVERHILL, MA 01830

IBM
PROCESSORS
PERIPHERALS

- BUY
- SELL
- LEASE

Carlyn Computer Systems, Inc.
5203 Leesburg Pike, Suite 1204
Falls Church, Virginia 22041
Call Collect (703) 820-3754

Computer Sales & Leasing

SYSTEM
38•34•32•3

5110•5120

SERIES 1

5251	3262
5256	3287
5211	3276

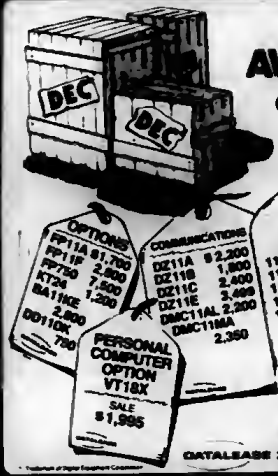
3344	3741
3411	3410
3340	029/129

CCSI

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

Buy/Sell/Lease
SWITCHING
IBM 2914/3814
Locom LCM-500
T-bar 3915/3916
DataSwitch 1000
Beall BCS-3/BCS-5
Jack McAuliffe
4235 LBJ Freeway #210
Dallas, TX 75234
214-661-3661

FOR SALE/LEASE
3770 SYSTEM
AVAILABLE NOW
3777-001
3782-001
2502-A03
3203-003
3521-001
Call Jim Earlewine
(512)690-0841



SUPER SUMMER SPECIALS
AVAILABLE FROM STOCK!
Call DATALEASE 800-854-0850
ALL EQUIPMENT FOR SALE OR LEASE
"The DEC® Specialists"
DATALEASE 2770 East Regal Park Drive, Anaheim, CA 92806 In California call: 714/632-6995 or 800/257-7338

FOR SALE
(1) 1403 IBM 600 LPM Printer
(1) 5421 IBM Prtr. Control Unit
Under IBM Maintenance
Reasonable Market Value
BURMAH-CASTROL
30 Executive Ave.
Edison, NJ 08810
Contact Paul Jasper
(201)287-8063

For Sale or Lease
Datapoint 1132 Diskettes with 9402 Comm. Adaptor Available Now
(4) Datapoint 9622 Printers Available Now
(1) 3375 A01, (3) 3375 B01's, 8/20/82 Shipment
(1) 38-5 with 1/2 Meg. Available Now
(1) System 3D-22 w/256K Memory, 1403 Printer Available Now
(1) 3380 AA4, (1) 3380 B04, (1) 3880-3, 9/10/82 Ship
(1) 3271, (8) 3277, (5) 1377's Available Now
Call Bridget Gallegher
Old Colony Group
(617) 444-2930

DEC Equipment
VT-100....$1,375.
LA-36.....$895.
LA-120....$1,995.

Our Special 165 cps Printer
Alanthus Model T-1210 with numeric keypad, paper out, HTN/TIFF, pedestal, and more only $1,295.

Anderson Jacobson Modems and Couplers
AJ 1234 ..$ 749.
AJ 1235 ..$ 849.
AJ 1256 ..$ 749.
AJ 1259 ..$ 849.

212A—compatible modems
Van-Tel and Penril from $795.

Brand new—in factory cartons
Full 30-day warranty included
Call today 800-638-6712 Telemarketing Dept., X 300
M/ACOM
M/A-COM ALANTHUS DATA
6011 Executive Blvd., Rockville, Maryland 20852
(301) 770-1150

DEC SHOPPER'S LIST

Item	Unit Cost
AR11-K	$ 660
DR11-C	400
DV11-AA	2,090
DV11-BB	1,440
DV11-BC	1,540
H960-DH	900
MK11-CE (2)	5,500
MM11-DP (16)	100
RH11 Complete (New)	5,000
RK06 (2)	1,500
RK611 CTL Complete	3,500
DMR11-AC (4)	4,200
TE10W-EE	1,500

C. D. SMITH & ASSOCIATES, INC.
(713) 468-2384

NEW
Vax 11/750
1/2 MB Memory
300 MB Disk Drive
125 IPS Tape Transport
DZ11-A Multiplexer
$99,999
Nordata
206-282-2323

MARION
BUY•SELL•RENT
IBM SYSTEM/34
- IMMEDIATE DELIVERY
- ALL SYSTEMS ARE FULLY RECONDITIONED AND RE-CONFIGURED TO YOUR NEEDS
- GUARANTEED IBM MAINTENANCE
- PERIPHERALS
- UPGRADES
- FEATURES
- SHORT TERM RENTALS
- LONG TERM LEASES AT GUARANTEED SAVINGS
- PURCHASE/LEASEBACKS

A PHONE CALL CAN SOLVE YOUR EQUIPMENT PROBLEMS
TALK TO US ... NEW JERSEY (201) 343-4554
CONNECTICUT (203) 758-2409
WILLIAM MARION CO., INC

WANG
800-526-0791
IN NEW JERSEY (201) 864-0920
BUY AND SELL • 2200T, VP, MVP, VS • WORD PROCESSORS
STANDARD DATA EQUIP INC. SDE LARGEST AND MOST ACTIVE IN THE USA

ADDS TELEVIDEO OKIDATA
NEC ANNADEX QUME ALTOS
NORTHSTAR
JULY SPECIALS
NORTHSTAR Advantage $2699
OKIDATA 83A w/tractor $699
OKIDATA 82A $449
NEC 3510 $1795
Specials Reflect 2%
For Cash in Advance
To Place Order Contact "SALES"
BASIC RESEARCH
81 McKinley Way West
Youngstown, OH 44514
Collect (216)757-9969

3033-S8
12-30 MONTH LEASE
AVAIL. 10-1-82

ADDITIONAL EQUIPMENT

3800	Printer	Sale or Lease
(4) 3287	Printers	Sale or Lease
3420-5	Tape, Dual Density	Sale
158	2 meg NAS memory	Sale
138-J	CPU	Sale or Lease

Danville Financial Leasing
(415) 838-1406
Fred Hogeman — Loren Campbell

ALL 370 & 4331 SYSTEMS
CPU's & Peripherals
Purchased, Sold & Leased
CORPORATE COMPUTERS, INC.
Contact: Norm Burger
(203) 661-1500
115 Mason St., Greenwich, Conn. 06830
Member Computer Dealers Association

RP06-AA
1 1/2 Years old
DEC maintained
Immediately Available
$15,200
NPI
National Peripherals, Inc.
312-325-9700

LEASING A LARGE COMPUTER?
Look for the best deal in the classified pages of COMPUTERWORLD
Call 800-343-6474
(or 617-879-0700) for more info.

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

IBM

GSD	DPD
Series 1	4331
5110	4341
Sys/34	370
Sys/32	Tape
Sys/38	Disk
Sys/3	3270's
Sys/23	3741

800-328-3884
612-339-3042

XRAXIS COMPUTER SALES

1614 Harmon Pl.
Minneapolis, MN 55403

GSD SYSTEMS SYS 3 SYS 32 SYS 34 SYS 38

SERIES 1 SYSTEMS
We will buy any system

FINANCIAL PRODUCTS 1419 1255 3890

DPD SYSTEMS 4331 4341 3031 3032 3033 3081

MEMORY AVAILABLE FOR ALL IBM PROCESSORS

★ When you have to be right on the money.

call **dataserv**

TOLL FREE 800/328-6729
IN MINNESOTA CALL COLLECT 612 933-2575

PERIPHERALS All Peripherals on short or long term lease
3330 3340 3350 3370 3880 3410 3411 3420 3203 3505 3525 4403

Dataserv helps you get maximum return on every dollar you invest in IBM equipment. Call us when buying, selling or leasing.

dataserv DELIVERS IBM COMPUTER MAINTENANCE AT MONEY SAVING PRICES. CALL FOR DETAILS.

CDLA

INVENTORY CLEARANCE

SMS-FWD0101 LSI-11 Winchester/Floppy controller $995
MSV11-DD $210
KPV11-B Power Monitor $225
DRV11 $145
H9270 $110
DRV11-J $279
Data Royal Printers
136 col IPS-5000A with options $995
Shugart Drives
SA851R dbl Sided/Density 1MB Floppy $395
SA1004 8 inch 10MB Winchester $895
Lambda Power Supplies
LYS-Y-5 5 Volt 11 amp
LYS-W-5 5 Volt 35 amp
Best Offer
Power 1 Power Supplies
HD12-6.8 12 Volt
HD24-4.8 24 Volt
Best Offer
Summmagraphics
Bit pads 11 X 11 RS232 $500

(617)893-6390
Contact Steve Barker

NEW DEC MEMORY

Immediate Availability

All New — All DEC
No Third Party Memory

All eligible for DEC Field Service

MK11-BE	$1,100.00
MK11-BF	$4,350.00
MK11-CE	$6,500.00
MS11-MB	$3,500.00

Call Nick Wessel
(703) 841-6232

PRIME 550

For Sale by
Connors Steel Company
Huntington, WV
(1) Prime 550 CPU with 1.25 MB Memory
(3) HS-AMLC Boards
(12) EIA Cables
(1) GE Terminet 30 Console
(2) 300 MB Disk Drives
(1) 600 LPM Printer
(1) 800/1600 BPI 9-Track Tape Drive
(5) Texas Instruments Model 810 Printers
(38) Adds Regent 200 Terminals
(1) Intertec Intertube Terminal
(30) Pairs Gandolf Short Haul Modems LDS120
(1) Data Phone Modem Cabinet
(2) Micom Micro 800 Data Concentrators
(1) Ball TD Monitor

Contact
Charles Woolcock
(304) 529-7171

Dealers in: IBM PROCESSORS/PERIPHERALS

3350 ALL MODELS
IMMEDIATELY AVAILABLE
3370 NEW AND USED
30-120 DAYS
3375 NEW
30-120 DAYS
3380 NEW
30-120 DAYS
—SELL OR LEASE—

ALSO AVAILABLE:

4331 Systems	Used-Immediate
4341 Systems	New and Used-Buy and Sell
Series 1	Want to Buy Any Model
System 3	All Models-Best Buys
System 32	Several-Immediate
System 34	Large and Small-Immediate
System 38	New and Used
3880	Mod 1-2-3 30 Days
3278	Mod 2-Immediate
3279	Immediate
3287	Mod 1 and 2-Immediate
3350	Several-For Lease-Immediate
3340	A2 and B2-Immediate
3344	Several Available
3411/3410	Several Available
3420	Most Models
3741/3742	Several Available

CDLA Member Computer Dealers & Lessors Association
asco MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

data:3 1-800-328-7938

DEC & DG

** IN STOCK**

80 MB $8,950
Disk Subsystem including CDC 9762 disk, controller, cables

9762 from **$4,500**

70 MB $4,195
Kennedy 5305 Winchester

DZ11-E $2,550
Replacements

37.5 IPS $3,995
Pertec Magtape subsystem includes controller and cable

California Computer Group
(714)966-1661
(800)854-7488

NCR USERS

We deal exclusively in NCR Computer Equipment. If you're buying or selling deal with the nations oldest and largest. Contact Gary E. Zywotko.

(612) 884-0758
Computer Connection Corp.
8120 Penn Ave. South
Minneapolis, MN 55431

EQUIPMENT AVAILABLE

Description	For Sale/Lease	Date
370/168		
3168 - U04 (2150, 2151, 3855, 4650, 6111, 7850, 7905, 3066-2 and 3067-3)	Lease Only	Now
3168 - U02 (2150, 2151, 2152, 3623, 3855, 4650, 6111, 7850, 3066-2, 3067-3, 2860-2, 2870-1, 2880-2)	Lease Only	Now
3168 - KJ (1435, 3855, 3066-2, 3067-2, 2-2870's, 3-2880's	Lease Only	Now
370/158		
3158 - U05 (1433, 1434, 1435, 7840, 3213-1)	Lease Only	Now
3158 - U04 (1433, 1434, 1435, 2150, 2151, 4650, 6111, 7840, 4450, 3213-1	Sale or Lease	Now
3158 - JI (1433, 1434, 7840, 3213-1)	Lease Only	Now
3158 - J (1433, 1434, 1435, 4650, 7840, 7905, 3213-1)	Lease Only	Now
3042		
3042 - 2	Lease Only	Now

215/964-2000

LFC

Contact: Jack Northrop
Lease Financing Corporation
3 Radnor Corporate Center
100 Matsonford Road
Radnor, Pa. 19087
215/964-2000

CDLA Member Computer Dealers & Lessors Association

buy sell swap | buy sell swap | buy sell swap

Want to Buy, Sell or Lease?

Or just upgrade your present equipment?

JUDY, MARILYN AND DEBBIE WILL SAVE YOU MONEY

Call 214-258-0541 Today!

System/32s, 34s, 38s, 4300s, 3270s, 370s, all peripherals and I/O...much more!

MCC METROPLEX COMPUTER COMPANY, INC.
320 Decker Drive • Suite 180 • Irving, TX 75062 TWX 910-860-9285

EQUIPMENT WANTED

WANTED IMMEDIATELY

IBM 158-3 (Serial # 24,000+)

Model U58 - 6 Meg IBM Memory

with the following features

1433	4650(9318)	1850
1434	6111	3213-1
1435	7730	9903
2150	7905	9080
2151	7840	9824R or 9825L Any Color

Equipment Wanted Immediately

Contact Bill Freund or Mike Raiser
212-841-1103
Loews Corp.
1350 Avenue of the Americas, New York, N.Y. 10019

3380-AA4/B4
3880-2/3

60 Day Delivery

3350 3370 3375

Immediate Delivery

Sale or Lease

Contact Your Local Office

Atlanta	404—256-5956	Florida	305—428-3177
Boston	617—542-4005	Ft. Worth	817—534-1774
Chicago	312—690-3000	Michigan	313—644-1500
Connecticut	203—655-1211	New Jersey	201—569-9666
Dallas	214—258-5444	San Francisco	415—944-1111
Washington, D.C.	301—441-1000		

COMDISCO

DEC*11/750 FLOATING POINT FP 750-AA

New — In Stock

SAVE BIG

$ $

800-854-0350

IN CALIF 714-632-6986

* Reg. Trademark Digital Equipment Corp.

BUSINESS OPPORTUNITIES

Brand New

11/44

35% OFF

Quodata

GERMANY-General Manager-EDP-Industry of US Terminal-Manufacturer is looking for a new challenging task, i.e.

- Establishing your new German subsidiary/operations from the scratch
- Building up your sales force and service organization
- Giving you all the contracts you need to the German EDP-Mgrs/Prospects
- Providing you with an office, secretary etc.
- Taking over your distribution

Your partner in Germany: 37 years, German National, Degree in Electronics (Digl.-Ing.), besides English knowledge of French and Dutch, excellent references. 12 years experience at major International EDP-Manufacturers in the area of: System Software, Mini Computer OS, TP-Networking (OSI, X.25), Terminals, Project Mgmt., Sales, Leasing, Marketing and Company Mgmnt. with full P'L-Responsibility.

Walter Lentzen, Langenbruesk 20, D-5000 Berg. Gladbach 3, Germany, Tel.: 2204-61962.

PROTECT YOUR 3370

Our easily installed clear, acrylic protective cover prevents accidental changes to the 3370 Disk Memory controls.

$10.- plus $1.50 for shipping and handling (Allow 3 wks delivery)

Remit check or money order to: DATACOVER ENT. 526 Robbins Troy, Mich. 48084

REAL ESTATE

IBM For Less.

Lease Financing

- New IBM Equipment
- Purchase/Leasebacks of Installed Systems

Equipment

- IBM 4300's
- Systems 38's
- System 34's
- Peripherals

TexCom.
• Equipment Leasing Services

Houston 713/890-8714
San Antonio 512/690-9026
Memphis 901/761-9336

Please Call For A Proposal

FOR SALE BY OWNER

IBM SYSTEM 38 MOD 5

1 5361-561 Processor includes:
1.5 MB Main Memory
64.5 MB Disk
1st & 2nd System Printer Attach.
Disk Storage Attach.
Mag Tape Attach.
1 3370-A11 570 MB Disk Storage
1 3262-A01 650 lpm System Printer
13 5251-011 Display Stations

Currently Under IBM Maintenance
Available October 82 Time Frame
Contact: Fred O'Leary
(617) 273-1560

FOR RENT

5,000 SQ. FT.

- Set Up Ideally for Data Computer Processing
- Midst of the Walt Whitman Shopping Center.
- Prime location on Rt.110, Huntington, NY

(516)423-3841 or (516)423-3824

DALLAS - FORT WORTH

THE COUNTRY'S NEWEST RETAIL COMPUTER MARKETING CENTER

TENERIS, INC. is a specialist in leasing to high-technology companies.

SALES OFFICES
OFFICE/WAREHOUSE
OFFICE/SHOWROOM

Several ideal locations of any size.

TENERIS, INC.
214/867-5500

WANTED!

SYSTEM/32 SYSTEM/34

If you have a System/32 or System/34 to sell, we would like to buy it. Since we are dealing on behalf of already committed buyers, we can afford to pay top dollar for your computer.

CONTACT
Mr. William Bell
National Medical Computer Services, Inc.
7578 Trade Street
San Diego Ca. 92121
(714) 566-9920

DEC DATA SYSTEM 500

PDP-11/34A
192 KB MEMORY
1-VT52 1-LA180 1-RP06
1-RK05J 1-RK05F
$35,000 OR BEST OFFER

DEC WPS208 WORD PROCESSING SYSTEM
WITH DEC LQP78
LETTER QUALITY PRINTER
$8,000 OR BEST OFFER
(213) 295-8616

FOR LEASE

COMPUTER FACILITY - L.A.

- 21,000 sq. ft. - 12,000 Office/ 9,000 Warehouse
- 36 Offices +
- Abundant Free Parking
- Extensive Communication Lines

Jeff Woolf (213)710-8600

Allen Trowbridge COMMER & SHEFFIELD

Find the right facility in the Real Estate pages of *Computerworld*

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

DEC

DEC MEMORIES

11/34A Cache KK11A	$1785
11/70 1/2MB, MK11-CE	$3750
VAX780 1MB, MS780DC	$6750
11/44 256KB, MS11MB	$2850
11/34 256KB, MS11LD	$1585
11/34 128KB, MS11LB	$990
KK11-B	$2875

CALL RAY (617)275-6800

11/70 MEMORY

Mostek Add-on Memory 768KB
Model MK8601-B-08
used approx. 1 yr.
original cost $17,000
Contact Bob Undegraff at
800-523-0400
Omni Exploration, Inc.

MAINTENANCE

PDP-11/03 THRU 11/70
PERIPHERALS: CDC, PERTEC, PRINTRONIX & OTHERS
Servicing: San Jose, Monterey, Santa Rosa, Sacramento, San Francisco, Santa Cruz
408/293-5202
[illegible]

DEC NEW & USED

MS11-LD (NEW)	$1,650
11/34A-YE (NEW)	$10,500
FP11-F (NEW)	$1,950
FP11C (NEW)	$4,950

Systems - Options - Peripherals
LAKEWOOD COMPUTER CORP.
[illegible]
(408)296-2545

DEC RSTS TO MICRO
MICRO TO DEC RSTS

Online file transfer communications package. Accurate & complete exchange of any disk file between your APPLE (or any CP/M) micro, and a DEC PDP-11 RSTS system. $895 For details call or write Sandra Young.
GEORGE W. HALLAHAN & CO.
1080 Soldiers Field Rd., Boston, MA 02135
(617)782-6100

INVENTORY CLEARANCE

All New Dec Systems and Components
Decmates w/Software
11/24-AC Box
11X44-CA Box
11/24 w/Dual RL02 RSX11M
TU78-AB Master Tapedrive
TU77-AB Master Tapedrive
VAX 11/750 & 780 Custom Software
ACCESS INT'L
(617) 387-6882

New LA120-DA	$1,895
Used VT-100 Terminals	$995
New RK07's	Used RM02's

Used GDC Communication Equipment
Used TS-11's
Other DEC Systems and Terminals Also In Stock
SPARTIN SYSTEMS
14825A Memorial Drive
Houston, TX 77079
Tel. (713)496-0771

PDP-11/70

CPU, 96KW core, RP04 disk, TU10 tape, DH11-AA multiplexor, BA11-F box, LA36, (6) VT50. Power conditioning equipment avail...Asking $82,000.
Mark Zipkin (714)979-2460

RSTS SECURITY LOCK-11

Dave Mallery-NDD
215-364-2800

FIND A DISK OR A DEC IN THE CLASSIFIED PAGES OF COMPUTERWORLD

DATA GENERAL

C330 System 512KB	Call
C350 System 512KB	Call
8703 512KB MV8000 Mem	$7,000
8565 256KB Eclipse Mem	$3,500
8367 256KB Nova 4 Mem	$4,500
8967 256KB S140 Mem	$5,000
6021 9-Track Sub-System	$6,900
6027 9-Track Sub-System	$7,300
6040 Dasher	$1,000
6088 LP2 Printer	$2,500
6053 D2 CRT	$1,400
6106 D100 CRT	$1,800
6060 Disk Add-on	$15,500
6061 Disk Sub-System	$22,400
6061-A Disk Add-On	$19,400
6122 Disk Sub-System	$33,000
4242 Burst MUX	$2,100
4251 Com Chassis	$1,100
4255 ALM-8	$1,350
4258 ALM-16 (8 Line)	$1,000
4215 600LPM Printer	$8,500
D.G. to Printronix Interface	$350
Intl. Computing Systems	(612)941-2941

DATA GENERAL

Cs 30 System Mod c3
5 mb fixed disk 5 mb removable
diskette drive 30 diskettes
1p2 printer model 6053 crt
System Under DG Maintenance
$8,500
Contact Whalen Computers
(219)465-6676

For Sale By:
LEVITZ FURNITURE, INC.
(305)741-2926
"Data General Equipment"

(77) Nova 2/10 CPU Chassis	$300
(86) CPU Boards with APL	$200
(56) 8kw Memory Boards	$100
(90) 16kw Memory Boards	$200
(55) 4074 SLA Boards	$200
(75) Basic I/O 4007/8/10/22/19	$150
(88) 4063 Quad Mux Boards	$200
(6) D200 6106 CRT's	$1250

"Data General Compatible"

(17) Printronix P300 300lpm Ptr	$3500
(94) Printer Controllers	$100
(2) Diablo 1620 KSR Ptrs.	$1500
(32) Western Dynex 6203 10Mb Disk	$1500
(5) Digidyne D3001 Disk Cntrls.	$800

"Miscellaneous"

(74) ICC LSI 20 Modems 2000bps	$100
(450) Disk packs 12 Sector 5mb Top Loading	$10

Nova 3/12 ALM 8
ULM 5, New Comm Chassis New
Nova 3 Mem 64KB
Nova 4C 64KB, RTC New
Nova 4s 64kb New
6070 S/S Used
DG 4215 300 LPM Ptr. S/S $8,800
SYSGEN DATA LTD.
68 Hidden Ridge Dr
Syosset, NY 11791
(516)496-7777

Complete System by Owner
Nova 3/12, 128KB Memory
(1) 8533 Map Board
(1) 8535 Memory Management
(2) 4241 ULM5 Multiplexor
6070B 40MB Disk System
(7) 6053 Dasher CRT's
(1) 6087 LP-2 Dasher Printer
(1) M200 Data Products Matrix Printer
Kenmak Software
217-664-4721

IBM

SELL OR LEASE

(1) 1403-N1 w/UCS	$3,200
(1) 2821-3 w/(2) 3615 & UCS	$6,200
(1) 1419-1 MCR w/7731 3791	Call
(10) 3277-2 w/4633 (Qty Disc)	$1,650
(1) 3411-3 w/3221,7350	$13,500
(1) 3410-3 w/3211	$3,500
(1) 3350-B2	$24,500
(2) 3211/3811 w/5554,5553	$34,500

WANT TO BUY MOST IBM EQUIPMENT
OCM, INC. (913)381-3466

FOR SALE
3081 4MB 6 CHN $76,000
36 Month Lease
3033-U8 or U16
$24,500/month
Available July & Aug.
OCM, INC.
(913)381-3466

FOR SALE BY ORIGINAL OWNER
IBM SYSTEM 32-B34
16 K CPU
13.7 MB Disk
155 LPM Printer
IBM Maintenance; Excellent condition.
PRICE $7,500
Contact: Don Updike
(313)666-7900

FOR SALE
IBM SYSTEM 32-C44
285 LPM - 13.7 MB
$9,000
For More Information
Call: 1-800-328-5718

IBM

SYSTEM 32/34/38
BUY SELL LEASE
Peripherals-Features
Disk and Memory Upgrades
MIDLAND MARKETING CO.
Ron Dahl or Terry Swenson
(612)933-4146

FOR SALE OR LEASE

3333-11	3344-B2
3340-A2	3340-B2

JBS Computer Associates
(404)475-1080
Ask for Dwight or Greg [illegible]

FOR SALE

(1) 3340-A2	(2) 3340-B2
(1) 3410-3	(1) 5211-1
(1) 5330-B33	(1) 2701

NEED TO BUY

3138-H	3333-1
3411-1	5340-E36

(2)3274-D21
[illegible] Computer Corporation
[illegible]

For Sale or Lease
3370-A1
(3) 3370-B1
Available Immediately
Excellent Price
INTER-AMERICAN DATA, INC.
(404) 447-8782

SYSTEMS 34/38
Lease or Sale
WANT TO BUY S/34's (FOR INVENTORY)
Models & Peripherals
WE PAY CASH
LEAS PAK INTERNATIONAL
Tel.(617)299-0023

FOR SALE
3420-3 Single Density
Qty 3276-2 Any Configuration
Qty 3277 & 78-2 Any Keyboard
3274 Any Model 3272-2
3287-1's & 2's
3694-B02 (New) 3704-A1 (New)
WANT TO BUY
3203-5
3344-B2 3270 Equip
NCI 312-436-6330

IBM 4300
BUY SELL LEASE
All Systems and Peripherals
THE COMPUTER TRADERS, INC.
P.O Box 7055, Marietta, GA 30065
CALL: Jim Binkley
(404)955-0360

IBM 4331 Model J01
One Megabyte Memory
(2) 3370 Disk Units
(2) 3262 Printers
(1) 3411 Tape Drive
(8) 3278 CRT's
Available Late Summer/Early Fall
Contact Mr. Sadler or Mr. Greene
Brockman & Assoc., Inc.
(713)623-2700

FOR SALE
IBM 5120's
32K Models $6,300
48K Models $6,500
(913)539-4406

IBM 5251 Model 12's
5256 Model 3's
Available Now
DATA EXCHANGE
(312)963-4424

FOR SALE OR LEASE
3415 D25 BSCA LDA

3340-A2	3344-B2
1403-N1	3411-1
3277-2	
3747	3340-B2
3741	3742

EXCELLENT PRICE
INTER-AMERICAN DATA, INC.
(404)447-8782

For Sale Or Lease
3415 D06 BSCA BSCC LDA

3340-A2	3344-B2
1403-N1	3411-3
3277-2's	3741D/A

ALSO 3415-D34

3340-A2	1403-2
3741-1	3340-B2

Available Now At A Great Price!
DATAMARC (404)252-7460
6085 Roswell Rd., Atlanta, GA 30328

IBM

IBM 3168 INFORMATION SYSTEM
Includes: 3130 Processor
3101 Disc Storage Unit
8809 Mag Tape Unit
3288 Line Printer
Asking Price $92,000
Contact: Tom Lawson
(417) 881-3881
Bell Savings and Loan Association
P.O.Box 1776 S.S.S.
Springfield, MO 65805

For Sale 3168 Model 3
8MB
(2) 2880-002 BMPX Channels
(1) 2860-002 SEL Channels
(1) 2870-001 MPX Channels
3066-002 Console
3067-003 PDU
Available Now
Contact Karl Keil or Arne Ljungstrom
The Canada Life Assurance Co.
416-597-1456

IBM SYSTEM 3 Model 15D
For Sale/Lease By Owner
D21 (160K) CPU
3340 (100MB) Disk
3277 Console
8-3348 Data Modules
Contact: Ed Undercuffler
(203) 289-3381

System 3/15D For Sale
LDA 27 ports, BSCC1, BSCC2, BSCA
3277 Console
3340 A2 Disk
3344 B2 Disk
1403 Mod 2 Printer
3271 Attached Diskette
Contact: Jim Rowe
(214) 579-3600

129-3
$1,000 Ea.
Nominal Feature Charge
$100 Mo./Mo. $75 1 Yr
$50 2 Yr. Purchase Options
SYSCOMP
(813) 799-4310 Collect

3340 A2
Short Term Lease/Sale
$642/mo.
3348-70 Available
3370's New ITC
Vargo Companies
313-254-2850

For Sale
System 34
256K CPU, 197 Meg Disk
Magazine Drive
MLCA with 4 Comm. Lines
Workstation Expansion Feature
Also (2) 5251 Model 12 Remote
Call:
The Rachmani Corporation
(212) 223-0300

For Sale Or Lease

IBM	AVAIL.	PRICE
F1403N1 Ptr 3640	Now	Best Offer
(2) 2501B2 Card Reader	Now	B.O.
2821-3 Control 8637 & 8638	Now	B.O.
3410-2 Mag Tape S.D.	Now	Call
(3)3410-3 Mag Tape (1 Dual and 2 Single)	Now	Call
(2) 3420-4 Tape, Dual	Now	B.O.

4321J01 1 Meg CPU
Available now 50% of list
1421, 1601, 1901, 2001, (2) 3701, 4665, 5248, 5631, 5632, 8701, 4666

3370-A1 Disk	Avail. Now
Lease Only 90%	2 Year
(2) 3370-B1 Disk	Avail. Now
Lease Only 90%	2 Year

Call Mike Kennedy
Leasing Dynamics, Inc.
1717 East Ninth Street
Cleveland, OH 44114
(216) 687-0100

Available for Lease
JULY 3370A1's & B1's
AUGUST 3380A4 & B4
At Net IBM Monthly Lease Charge
Please Call Jean or Linda
(412)373-8010
CASHFLOW DESIGN INC.

IBM S/3 15D
Levitz Furniture Inc.
(2) Systems For Sale by Owner
(1) D26 CPU's 512K
(1) D24 CPU 256K
(2) 3340 100mb Disks
(2) 3344 404mb Disks
(2) 1401 N1 Printers
CALL: (305)741-2926

IBM

WANT TO BUY
SYSTEM 34's
ALL MODELS
Hans Broesler
DATA 3 COMPUTER CORP.
(612)941-8405
(800)328-7936

SAVE: LEASE YOUR IBM
- Displaywriters
- Datamasters
- Personal Computers

Computer Provisions Corp.
An L.D.I. Co.
Call Rick Spahek
(216)292-3774

FOR SALE
AVAILABLE NOW
• SERIES/1-MODEL 4955E with accessories
• Memory & System Extension features for IBM 168/AP
Blue Cross & Blue Shield of FL
(904)791-6723

SYSTEM 34 FOR LEASE
5340-C24
with 5211-002 and (2) 5251's
$1,300 per Month
Other System 34's Available
J.C. HOLLIMON INC.
8642 Tradeway
San Antonio, TX 78217
(512)828-1101

SYSTEM 34 USERS
Does the 'RPG 9038 (file name) THIS FILE IS FULL' message look familiar? Avoid this message by using 'SIZEIT'
CONTACT:
NEW COMPUTER SYSTEMS, INC.
P.O. Box 380D
San Antonio, TX 78230
512-699-6060

HONEYWELL

Available Immediately In All Configurations
DPS-6/32 6/34 6/48 6/54 6/74
(20) 256KB Memory
(6) MSU 9604 256MB Disk Dr.
(4) CDU 9638 80MB Disk Drives
(10) WST 7801 CRT W/S
(80) WST 7207 CRT W/S
(10) VIP 7300 Series CRT's
SELL - RENT - TRADE-IN
Best Discount
Call: Knaus Systems, Inc.
9960 West Lawrence Ave., Ste. 101
Chiller Park, IL 60176
(312) 671-4630

200/2000 SERIES
BROWN COMPUTER SERVICE, INC.
BUYS, SELLS/LEASES and MAINTAINS.
Complete and partial systems & peripherals with up to 50% discount on current HONEYWELL prices
Exclusive HONEYWELL Dealer
In Business Since 1976
Call or write W. E. Brown at:
1000 Southcrest, Arnold, MO 63010
(314)644-2323

ULTIMATE SYSTEMS
All Configurations and Upgrades
VIP7200 CRT's
$1,287 Purchase
$62/mo. rent
Call: Knaus Systems, Inc.
9960 West Lawrence Ave., Ste. 101
Chiller Park, IL 60176
(312) 671-4630

LEVEL 62
Honeywell Maintained
Available Now
Central Processor
256 K mem, 120 CPS Console
Best Offer Over $8,000
1200 LPM Printer
Print Belt & Stacker
Best Offer Over $30,000
Contact C.E. Waddell (804)877-4453

LEVEL 62-64
LEVEL 6
SERIES 200-2000
SYSTEM OR PARTS
URS
66 Montvale Ave.
Stoneham, Ma. 02180
(617)438-4300

HEWLETT PACKARD

HEWLETT - PACKARD
1000 • 2000 • 3000
Systems - Peripherals
AIRBORNE DATA SYSTEMS
1112 WRIGLEY WAY
MILPITAS, CAL 95035
(408) 262-8137

PLEASE MAKE OFFER
Must Sell
(6) New HP 2626A
Other HP terminals available
Mr. Beaver
(213)680-3822
(800) 421-4806

WE BUY AND SELL
HP 3000 COMPUTERS
SERIES/II, 30 & 33
Complete Systems, Memory, Terminals, Disk Drives, Tape Drives, Miscellaneous Parts.
AVAILABLE IMMEDIATELY
FINLEY & ASSOCIATES
(213) 628-8048

MISC. SYSTEMS

DATAPOINT For Sale Or Lease By Owner
4730 DATASHARE SYSTEM
6600 CPU 256K
9374-20 Mb Disk
Multi-port Comm. Adpt.
(1) 9375 Disk Ext. 20 Mb Disk
(2) 6742 Multi-port Comm. Adpt.
(1-12) 8200 Data Station
(1-12) Xerox 1740 Term. Ptrs. Letter Quality
Call Roland Nordeen (404)881-8475

HARRIS
H500 CPU with 1 MB of Memory
600 LPM Line Printer
300 CPM Card Reader
600 MB Disk w/Controller
800/1600 BPI Tape Drive
Peripheral Cabinet
19 Bee Hive CRT's, 4 CDC Disk Packs
Bridgeport Machines
Contact Frank Jasner
(203)367-3651

MACOM/OSI MICROS
1, 10, 40 & 80 Meg.
Reliable, Fast, Multi-User Systems
New or Used
Call for prices
MCD CORPORATION
(313) 924-1020

SYCOR

340 Comm. Terminal	Best Offer
350 Comm. Terminal	B.O.
405 Comm. Terminal	B.O.
440 Comm. Terminal	B.O.
445 Comm. Terminal	CALL
4615 Display CRT	B.O.
4412 Display CRT	B.O.
2057 7 Trk. Tape	B.O.
2059 9 Trk. Tape	B.O.
6730 Spider Printer	B.O.
6180 Sprinter Ptr.	B.O.
6794 Printer 600 LPM	B.O.

We Can Supply Any Items Sycor Produced.

DATA 100

78-220 Batch Terminal	B.O.
78-230 Batch Terminal	B.O.
77-101 Key Batch Comm. System	B.O.
82 On-Line System	B.O.
85 Computer Systems	B.O.
8794 Display CRT's	B.O.
8802 9 Track Tapes	B.O.
8804 Card Reader	B.O.
8418 Line Printer	B.O.
8409 Line Printer	B.O.

WE STOCK ALL DATA 100 EQUIP.
INT'L. COMPUTING SYSTEMS
(612)941-2941

More Bulletin Board on the next page.

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

BASIC FOUR

BUY SELL LEASE
BASIC 4
Systems, Peripherals, or Components
ALETA ENTERPRISES INC.
Contact Ty Mustafa
(714)652-3569

NCR

NCR FOR SALE OR LEASE
658 DISK UNITS
Eligible for NCR Maintenance
Available Immediately
HARWOOD & ASSOC.
2 Northgate Park, Ste.304
Chattanooga, TN 37415
Tel.(615)870-6000

WANG

For Sale
WANG 2200T
2260B/2260BC 20 Mug Disk M/S
(2) 2226 16K CRT'S
(1) 2231W Matrix Printer
(5) 5 Meg Removable Packs
(813)629-2182

DISK DRIVES

PRIME
Disk Drives @ up to 50% Savings
New & Available for Immediate Delivery
NORDATA
206-282-2323

PRINTERS

FOR SALE
DEDICATED DATA MODEL 6615
1500 LPM
Continuous, IBM System 38 Compatible Printer.
Factory Maintenance
WANDS COMPANY, INC.
Richmond, Va
(804)257-4466

MISC.

COMPUTER FLOORS
Used-New
Bought-Sold
Installation
Alteration
Refinishing
Parts and Service
RC FILES ASSOCIATES, INC.
16 Voorhis Lane
Hackensack, NJ 07601
(201)488-9666 or (212)564-4828

BURROUGHS

FOR SALE: NCR Model 9130
Single Processor System & Cabinet
64 K Mem, 2 MB for Flexible Disk
80 LPM Tabletop Matrix Printer
System operable under 110 & 115 volt
Programmed w/system support and application software (inv., gen. ledger, accts. pay. & accts. rec.)
Contact John Allred (904)904-1000
Kingsley Bank, 1897 Kingsley Ave.,
Orange Park, FL 32073

WANG
Disk Drives @ up to 50% Savings
New & Available for Immediate Delivery
NORDATA
206-282-2323

For Sale
2 AMPEX DM980 Drives
$3000 each
HAROLD
(415) 858-2900

Call
1-800-343-6474
to place your ad

DATAPOINT
Buy* Sell* Trade
American Computer Exchange
(216)247-2100

WANTED TO SELL
1055 SYSTEM
• With 524KB, Multi-line control
• (2) 208 Drives, 750 LPM Printer
WANTED TO BUY
• TD830 CRT's, MT983 CRT's
• All Systems & Peripherals
$1955 Avail. 4th Quarter
Mr. Rose (216) 282-3774

FOR SALE: NCR V8570
1 meg memory, system card reader, console keyboard & CRT, console 200 lines/min printer
Available Now
Contact Mike Pickering
(703)560-6000 x1160
Perpetual American Federal Savings & Loan
2004 Eisenhower Ave.
Alexandria, Va 22314

Wang Minis & Micros
• Contract Programming* Anal Cobol
• Accounting & Business Applications
• Consulting Hardware & Software
• Complete Training & Support
Call (201) 488-2226
CLIFF DATA SYSTEMS, INC.

CDC 9766
$11,500
Call Ann
(714) 632-6925

TERMINALS

For Sale or Lease
Documation Printer 1250
Memorex 1270 Terminal Controller
Telex 271 Controllers
NCR/Comten 3650-H4
Call C. Mire
(305)884-3083

PERKIN ELMER

FOR SALE: PERKIN ELMER MEMORY
• 256 KB Boards
• 524 KB Boards
• 1 MB Boards
ALSO
• Intelligent Disk Controllers & CDC 300 & 675, MB Disk Drive
• 6250 Tape Drive
• Misc. Used Equip.
California Minicomputer Systems
Call Merle Lang (213)866-4521

T I

FOR SALE
NEW
TI 990/10 MODEL 9
With 256 KB mem, (2) 911 VDT's and 810 printer. Never Unpacked. TI warrantee.
(213)724-3600

WANTED
WANG
SYSTEM 25 or 30
CPU & DISK DRIVE
CALL PAT
(201)238-7550
National Computer Rental Inc.

Your ad can be seen here for just $99.

MODEMS

MODEMS
2400 BAUD
65% OFF
203-673-4047

FOR SALE
167 M.S.I. Model 2102
DATA TERMINALS
with all accessories
Call: Garth Gilboe
(313)275-5140

DATASOUTH
80T MATRIX PRINTER
180 cps
OEM PRICING!!!
Immediate Delivery
MCD CORPORATION
(313)624-1020

For Sale MG
Westinghouse computer power supply motor generator rated 75KVA with input power of 3 phase, 60 hertz 480 volts and 415 cycle output, previously used in conjunction with a 370/168 CPU. Price $13,000.
Contact
Auto Club of Michigan
All Van Dusseldo
(313)936-1300

$ RECESSION $
WHY NOT TAKE MONEY?
WANTED
Vintage Computers
Computer Boards
Components - Wire
Any Type of Precious Metals
Contact Mike (201)779-3939
$ $ $ SCRAP
426 Paulison Ave., Passaic, NJ 07055
Trade your scrap for gold and silver

THE BULLETIN BOARD

A Low-Cost Way to Sell Hardware and Software in Computerworld

What is The Bulletin Board?

It's a classified section in Computerworld designed especially for the selling and buying of individual pieces of hardware in a convenient, low-cost format. It is especially suited to companies that have a piece of used equipment they want to sell. For one low price, you can inform more that half a million Computerwold readers around the country of your equipment's availability.

How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only $99. (One unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software.

How to Place an Ad in the Bulletin Board.

Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

ORDER FORM

COMPUTERWORLD BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. Computerworld comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications are: Altos, Burroughs, Control Data, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Selvage, Sperry Univac, Teletype, Terminals, TI, WANG, Miscellaneous.

Copy: Copy for your ad must be clearly typewritten and may be sent in via the mail or by telecopier (telecopier extensions are 410 and 451). Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $99.00 (One unit minimum and no fractional units allowed). There are no agency commissions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Issue Date(s): _____

Signature: _____

Name: _____

Company: _____ Title: _____

Address: _____

Telephone: _____

Send this form to:
COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 880
Framingham, MA 01701
(800) 343-6474 (617) 879-0700

SOFTWARE FOR SALE

The Right Combination

Unlock those tough conversion problems with Dataware's proven combination of software and services.

SPS/1400/1410 AUTOCODER to ANS COBOL

The industry's most successful translator will eliminate the burdens of emulation and costly maintenance of second generation language.

For more information please call or write today!
The Conversion Software People
Dataware, Inc.
2585 Elmwood Ave., Buffalo, NY 14217 (716) 876-6722 | TELEX 91519

NEW UAPLINK RT/RSX/TSX + VMS/RSTS

- AUTOMATIC File Transfers
- Remote Programmer Support
- Mix/Match Operating Systems
- Protected Binary/Text Data
- Single User Control
- Intelligent Terminal Mode
- Virtual User Facility
- POWERFUL Cmd. Language
- Data Compression
- Network Carrier Compatibility
- LOW Cost, Guaranteed

Sidgwick Automation Products
17922 SkyPark Cr., Suite L
Irvine, CA 92714
(714) 549-4832

Elegant Software

For IBM S/34 & S/38 Computers

General Ledger/Financial Reports
Accounts Payable
Accounts Receivable
Payroll/Personnel
Order Processing
Inventory Management
Mailing Lists
Fixed Assets
Oil & Gas
Job Cost

J. D. Edwards & Company
Two Denver Technological Center
Englewood, CO 80111
303/ 773 3732
Dallas/ 214/ 484 8911
Newport Beach/ 714/ 751 5302

DG APPLICATIONS SOFTWARE

DOS and RDOS COMPATIBLE
Available in Conn. & Mass. Areas

Business Basic II	$750
Word Processing	$750
Accts. Pay./Gen. Ledger	$1,000
Accts. Rec.	$900
Inventory Control	$900
Order Entry, Billing, S.A.	$900
Supercomp	$1,000

COMPUTER MANAGEMENT ASSOC.
200 Park Rd.
West Hartford, CT 06119
CALL: (203)746-0288

NEW SERIES 1 EDX REPORTWRITER

ASSISTANT-DP

DATA ENTRY/QUERY/REPORTWRITING

CREATE APPLICATIONS LIKE
- Inventory Control
- Sales History
- Personnel Reports
- Mailing Lists
- Personnel Profiles
- and more...

With this versatile S friendly menu driven system without writing programs!

i-concepts, inc.
2540 Royal Lane
Dallas, Texas 75229
(214) 243-0700

SELL YOUR SOFTWARE IN THE CLASSIFIED PAGES OF COMPUTERWORLD

Call
800-343-6474
(or 617-879-0700)
for more information

HASP

VAX and PDP-11

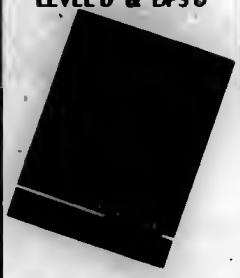
High speed communications link to
IBM•CDC•DEC•ETC
REMOTE BATCH DISTRIBUTED PROCESSING. AUTODIAL LOW OVERHEAD NO RISK TRIAL

datanex
Datanex Inc. P.O. Box 3688
Eugene, Oregon 97403 (503) 687-2670

MINI-COMPUTER SOFTWARE CATALOG OVER 300 PACKAGES IN INVENTORY

Ready to ship...ready to implement
Source...Media...Documentation
The RSI Catalog contains descriptions and prices on all packages in inventory. 1982 edition now available. Send check or money order for $64.95 to:
RESOURCE SOFTWARE INTERNATIONAL
140 Sylvan Ave.
Englewood Cliffs, NJ 07632
(201) 947-8194
Visa and Mastercard orders accepted

SOFTWARE HONEYWELL LEVEL 6 & DPS 6



PROVEN RELIABLE SOFTWARE FROM THE COMPUTER PEOPLE.

CD systems inc.
THE COMPUTER PEOPLE
14614 Center St., Suite 200
Omaha, Nebraska 68144 (402) 330-2910

CONVERSION PACKAGE WANTED

Burroughs to IBM

The Montana Department of Social & Rehabilitation Services is planning to convert a large COBOL System from Burroughs MCP to IBM MVS/OS. An adaptation from DMS II and GEMCOS to IDMS and CICS is required.

If you are aware of anyone who has successfully made this transition, such information would be greatly appreciated.

Please contact
Quian Johnson,
Systems Analyst
Department of S.R.S.
Box 4210
Helena, MT 59604
Phone: 406-449-4597

FINANSWER+

Electronic Spreadsheet System

- English Language
- Fast COBOL System
- 480 Rows or 720 Columns
- Password Protection
- Simple data entry
- 30 Day Moneyback Guarantee
- Write or call for brochure

$995
Datamate Company Inc.
4135 S 100th East Ave Suite 101
Tulsa OK 74145
(918) 664-7276

For Prime, DG, NCR, TI, HP

Coming Soon to a Computer Near You!

UNIX

Unix Operating Systems on DEC equipment.

IDS
International data services, inc.
(408) 730-UNIX

SYSTEM/34/38

Para Research offers a different marketing approach for software. We provide the best software packages at lower prices. We do this to obtain volume sales, a larger user base and to encourage user feedback. This approach and the input of our many users have made us what we are today: the world's largest distributor of System/34 software. All packages are completely documented, supported by our hotline staff and our money-back guarantee.

WORD PROCESSING $750

Paratext is the most successful and complete word processing system available for the System/34. There are more than 1,700 Paratext users. Paratext offers full-screen text editor, automatic justification, individual forms design, viewable corrections, heads-down typing, word wraparound, variable data insertion, label printing and math capabilities. Paratext is also available for the System/38 at $1,500

FINANCIAL MODELING $500

Paracalc is a diversified modeling system that easily calculates budgets, cash flow, sales projections, commissions, return on investment, production forecasts, anything you can set up in rows and columns. Change one entry and all amounts are re-calculated accordingly in up to 24 columns and 400 rows. Consolidation from many models to one. Return on investment. Available on the System/38 for $1,000.

ACCOUNTING SYSTEMS $500

General Ledger, Accounts Payable, Payroll, Fixed Assets Accounting and Accounts Receivable. Whatever your needs in financial applications, Para Research has the answer. All modules support multiple companies, all are interactive and all can be interfaced with existing software

MAPICS PURCHASING $1,500

MAPICS Purchasing provides complete tracking status for manufacturers using IBM's MAPICS System. It allows input of multiple vendors per item and interacts with MAPICS Accounts Payable, Inventory Management and Materials Requirements Planning modules. Users can produce reports ranging from Purchase Price Variance to Suggested Order Placement to Cash Requirements. MAPICS Purchasing eliminates key entry and typing of purchase orders. This is a must for every MAPICS user

PARAPLOT GRAPHING $350

Paraplot turns statistical data into easy-to-read bars or points. It creates graphs and charts for almost any business activity. In fact, you can produce graphs over 25 inches high. The system plots on your system/34 character printer and CRTs. No special plotting equipment is required

DATA SYSTEMS $250 to $600

Documentor, $600, provides complete automated documentation, with up to fifteen individual reports that describe systems and subsystems in each program. Clock, $250, an advance job scheduler, allows your System/34 to be productive 24 hours a day. Rescue, $250, is a procedure re-start program that can also be used to create duplicate programs and procedures.

Easy List, $600, a report program generator, compiles an RPGII report or CRT program from a series of simple English prompts. You no longer need a programmer to create your own meaningful management reports. Time Tracker, $300, allows you to easily and accurately allocate computer costs by department, user, workstation or printer.

PARA RESEARCH

At your request, we will send a complete set of documentation, free of charge. Call or write Software Sales, Dept. CW10, Para Research Inc., Whistlestop Mall, Rockport, MA 01966 (617) 546-3446, Ext. 701.

DATAPOINT APPLICATION SOFTWARE

"DOS and RMS COMPATIBLE"

Over 600 Users in 38 states and Canada
Complete Databus Source Code and Full Warranty On:

Accounts Receivable	Sales Analysis
Accounts Payable	Purchase Analysis
Payroll Processing	Personnel Reporting
Order Processing	Billing (Standard & Progressive)
Inventory Control	Purchase Order Management
Fixed Asset Depreciation	General Ledger
Job Costing with B.O.M. Processing	Check Reconciliation
Distribution	Club Accounting

ALL MSG SOFTWARE INCLUDES:

1 Time Charge - No Royalties	Complete System & User Documentation
Camera Ready Art Work On All Forms	6 Month Warranty

FREE with your order: On screen graphics plotting and bar charting programs w/print capabilities

Write or Call for our free brochure and pricing schedule.

MSG MINI-COMPUTER SUPPORT GROUP, INC.
3645 Warrensville Center Rd. 216-283-2000 Shaker Heights, OH 44122

TIME & SERVICES

370/158 AP & MEB
OS/MVS/JES II
RJE/TSO/CICS/BATCH
XEROX 9700
Laser . Printing Service
Excellent availability/
All shifts
Highly competitive rates
24 hours/7 days a week
Contact: Al Kolovchevich
(212) 484-8303

WARNER DATA SERVICES
A Warner Communications Company
75 Rockefeller Plaza
New York, N.Y. 10019

LOOKING FOR DEVELOPMENT TIME?
NO KILOCORE TICK CHARGES
NO CPU CHARGES
$7 PER HOUR CONNECT TIME
RSTS-E TIME
BASIC PLUS 2
COBOL
BASIC PLUS / PASCAL / C } WITH CROSS COMPILER SUPPORT
TSO-4 WITH PROCESSING
WAIT / TECO / EDT } PROGRAM EDITING
BUDGET BYTES™ 212-944-9230
by Omnicomputer™
1430 Broadway, New York, N.Y. 10018

COMPUTER TIME
INTERACTIVE & REMOTE BATCH
DUAL-NAS 7000's
MVS-TSO-RJE-SAS-CICS
Technical Support Available
VERY COMPETITIVE PRICES
Contact Clark Russell
(704)375-8100
Data Processing of the South, Inc.
Charlotte, NC

FIXED PRICE COBOL PROGRAMMING
HIGH QUALITY TESTED AND DOCUMENTED STRUCTURED CODE PRODUCED TO YOUR SPECIFICATION ON LOW FIXED PRICE BASIS.
ALL PROGRAMMING AND ANALYSIS PERFORMED ON OUR SITE AND TESTED ON OUR 4381.
WE ARE A 14 YEAR OLD, MULTI-MILLION DOLLAR CORPORATION WITH A TRAINED STAFF OF PROGRAMMING PROFESSIONALS.
For further information contact:
Louise M. Glover
General Manager
Information Products Div.
RCS Inc. - Dept. 100
940 Franklin Turnpike
Ridgewood, NJ 07450
(201) 444-4003

DATA GENERAL ECLIPSE C330, C350 TIMESHARING
- AOS, DBMS, INFOS
- FORTRAN, COBOL
- $10/Hr. Connect, $.15 Per Block Per Month Storage, No CPU Charge
- NYC Office Space with Terminal Available

Dick Traum
(212) 366-0346

TIMESHARING AVAILABLE
VAX 11/780-VMS
PDP 11/70-RSTS/E
- FORTRAN, COBOL, BASIC
- DATATRIEVE
- ORACLE ®
- STATISTICAL PACKAGES
- DECNET
- TYMNET ACCESS

CONTACT:
James F. Kelley
INSLAW, Inc.
Washington, D.C.
(202) 628-8000
® trademark of Relational Software, Inc.

DEPOT
COMPUTER REPAIRS
DEC-NOVA
ALL BOARDS
CPU-MEMORY-I/O ETC.
MEMORIES AND POWER SUPPLIES
ANY MANUFACTURER

Computer Services
4341-2 370/158-3
VS1-CICS-ROSCOE-DOS
REMOTE JOB ENTRY
CICS DEVELOPMENT
CICS PRODUCTION
CUSTOMIZED SOFTWARE
CONTACT JOE BARRETT
(201) 777-3454
15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

CLASSIFIED ADVERTISING ORDER FORM
Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $97.30 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $194.60 per insertion. Extra space is available in half-inch increments and costs $48.65. Box numbers are $10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____ Title: _____

Address: _____

Telephone: _____

Send this form to:
CLASSIFIED ADVERTISING, COMPUTERWORLD
375 Cochituate Road, Box 880, Framingham, MA 01701

ADVERTISERS' INDEX

Amer-Cal ... 12
American Computer Group ... 66
Applied Digital Data Systems ... 51

Bausch & Lomb ... 44
John Beall ... 57
B.I.Moyle Associates ... 48

California Software, Inc. ... 42
C.C.S. Inc. ... 53
CGA ... ID/24
Chubb Institute ... ID/17
CMI ... 52
Codex Corp. ... 63
ComData ... 45
ComDesign ... 65
Communications Electronics ... 96
Computer Associates ... 5
Computer & Terminal Exchange ... 62
Computerwise ... 18
CRWTH Computer Coursewares ... 55

Dallas Market Center ... ID/16
Data Processing Design ... 42
Data Systems for Industry ... 36
DBMI ... 8
Deltak ... ID/8
Digital Associates ... 59
Digital Engineering ... 47
Digital Equipment Corp./NPM VAX ... ID/4-ID/5
Digital Pathways ... 17
D.P. Facilities ... 43
DPX, Inc. ... 30
Duquesne Systems ... 35

Execucom ... 46

Farleigh Dickinson University ... 20
Fibronics ... ID/22
Four Phase Systems ... ID/18-ID/19

General Systems Center, Inc. ... 27

Hewlett Packard-BCG ... 40-41
Hewlett Packard-DTD ... ID/23
Honeywell Info Systems ... 28-29
H & W Computer Systems ... ID/26

IBM/Applications ... 26-27
IBM/Copier Division ... 10-11
Information Concepts ... ID/25
Innovation Data Processing ... 9
Invitational Computer Conference ... 20
ITT/Worldcom ... 19

Lanier Business Products ... 14-15
Lee Data ... ID/26
Linkabit, Inc. ... 38-39

McGraw-Hill ... 6
Memorex Communications Group ... 53
Microdata ... 64
MTI Systems, Inc. ... 36

National Computer Maintenance ... 61
NEC Information Systems ... 22
Newcorp Products ... 66

Omni Magazine ... 54
O'Neil Data Systems ... 15
Oregon Software ... 65

Panaphic Systems, Inc. ... 49

Questronics ... 4
Qwikterm ... 18,44,64

Radio Shack ... ID/3

SAS Institute ... 34
SDI ... ID/25
Selanar Corp. ... ID/6
Selectern ... 23
Serena Consulting ... 64
S & H Computer ... ID/7
Sheraton Tara ... 62
Signal Technology ... 30
Softmatics ... ID/7
Software AG ... 37
Software International ... 60
Storage Technology Corp. ... 30
Syncsort, Inc. ... 3
Sys-Ed ... 30

Tandem Computers, Inc. ... ID/9-ID/14
Telesy Div., Research, Inc. ... 16
Texas Instruments ... 21
Tymark ... ID/20
TOSC International, Inc. ... 48
Toshiba Corporation ... 43
Transnet Corp. ... 30

Verbatim ... 58
Vertex Systems, Inc. ... 22

Westwood Associates ... 43
John Wiley & Sons, Inc. ... 31

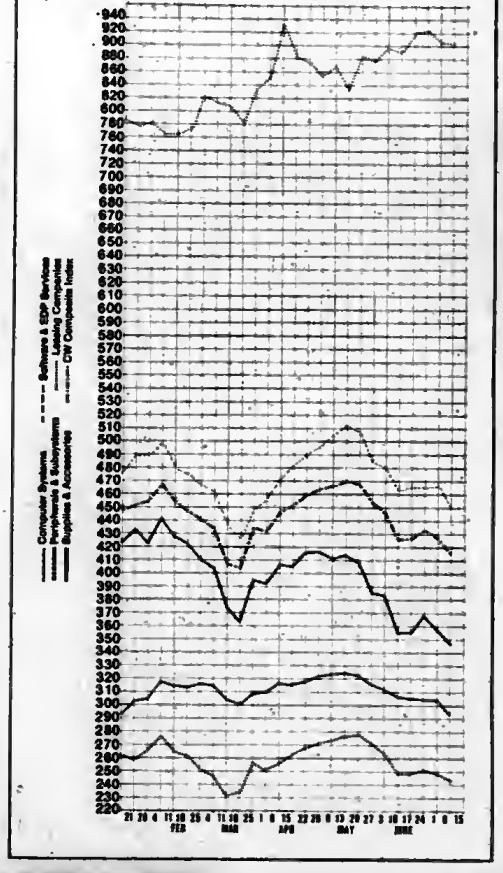
Xerox-Computer Service Div. ... 56

Yourdon ... 61
Yourdon Press ... 7

Zilog-Systems Division ... 24-25

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



Computerworld Sales Offices

Roy Ennenhofer, **Vice-President/Marketing.** Donald E. Fagan, **Vice-President/Sales.** Frank Collins, **Manager, Display Advertising.** William J. Mills, **Manager, Classified Advertising.** Diane La Muraglia, **Manager, International Marketing Services.** COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701, Phone: (617) 879-0700, Telex: 95-1153

BOSTON SALES OFFICE: Chris Lee, **Northern Regional Manager.** Edward P. Marecki, Joseph Fitzhugh, **District Managers.** Kathy Doyle, Diane Sukey, **Account Coordinators.** COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701, Phone: (617) 879-0700, Telex: 95-1153.

NEW YORK SALES OFFICE: Michael J. Masters, **Eastern Regional Manager.** Peter Senft, Doug Cheney, Ray Corbin, **District Managers.** Fred LoSapio, **Sales Assistant.** COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, N.J. 07652, Phone: (201) 967-1350.

CHICAGO SALES OFFICE: Art Kossack, Newt Barrett, **District Managers.** Jan Raska, **Account Coordinator.** COMPUTERWORLD, 2600 South River Road, Suite 304, Des Plaines, Ill. 60018, Phone: (312) 827-4433.

LOS ANGELES SALES OFFICE: Jim Richardson, **District Manager.** Bob Hubbard, Debra Pendergrass, **Account Managers.** Beverly Rass, **Account Coordinator.** Eileen Dunn, **Recruitment Account Manager.** Phone: (415) 421-7330. COMPUTERWORLD, 18008 Skypark Circle, Suite 260, Irvine, Calif. 92714, Phone: (714) 556-6480

SAN FRANCISCO SALES OFFICE: William J. Healey, **Western Regional Director.** Barry G. Milione, Rick Jamison, **Account Managers.** Ruth Gordon, **Account Coordinator.** Eileen Dunn, **Recruitment Account Manager.** COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, Calif. 94133, Phone: (415) 421-7330

JAPAN: Mr. Shohei Kurita, COMPUTERWORLD JAPAN, 1-19-7 Shimomi, Chuo-ku, Tokyo 104, Phone: (03) 551-3882, Telex: 252-4217. Esteban H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-Ku, Tokyo 101, Phone: (03) 230-41178, Telex: J26860. **UNITED KINGDOM:** Richard Hease, ECC Publications, 30-31 Islington Green, London N1, Phone: (01) 359-7481. Euan C. Rose, Robert Hall, BEERE, HOBSON ASSOCIATES, 34 Warwick Rd., Kenilworth, Warwickshire, CV8 1HE, Phone: (0926) 512424, Telex: UK-311951. **WEST GERMANY:** Eckhard Utpadel, CW PUBLIKATIONEN, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61, Telex: W. Ger-5-215350-HKFD. **AUSTRALIA:** Alan Power, COMPUTERWORLD PTY. LTD., 37-43 Alexander Street, Crows Nest, NSW 2065, Phone: (02) 439-5133, Telex: SECCO AA25468. **BRAZIL:** Eric Hippeau, COMPUTERWORLD do BRAZIL, Servicos e Publicacoes Ltda., Rua Alondo Guanabara, 25/10th Floor, 20031 Rio de Janeiro, RJ, Phone: (021) 240-8225, Telex: 11-32017 (WORD BR). **MEXICO:** Richard Small, COMPUTERWORLD de MEXICO, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F., Phone: (905) 514-4218, (905) 514-6309. **FRANCE:** Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. **SPAIN:** Neil Kelley, COMPUTERWORLD/Espana, Barquillo, 38, Madrid-4. **DENMARK:** Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone 01-1234-11

CW COMMUNICATIONS/INC.

Board Chairman/Publisher
Patrick J. McGovern
President
W. Walter Boyd
Senior Vice-President
Lee Vidmar

Group VP-Communication Services, Jack Edmonston. **Group VP-Circulation,** Margaret Phelan. **VP-Marketing,** Roy Ennenhofer. **VP-Sales,** Donald E. Fagan. **VP-Finance,** William P. Murphy. **VP-Editorial,** John Whitmarsh. **VP-Special Publications,** Robert Ziegel.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701 Phone: (617) 879-0700, Telex: 95-1153.

SALES — **Vice-President,** Donald E. Fagan. **Display Advertising Manager,** Frank Collins. **Display Advertising,** Tracey Eastman, Anne Hadley, Pam Valentinas, Julie Sullivan. **Classified Advertising Manager,** William J. Mills.

COMMUNICATION SERVICES — **Group Vice-President,** Jack Edmonston. **Director Research,** Kathryn Dinneen. **Sales Promotion Manager,** Noreen Kimball.

CIRCULATION — **Group Vice-President,** Margaret Phelan. **Circulation Manager,** Barbara Jeannetti. **Service Rep,** Peggy Kelly. **Assistant,** Carmela Priante.

PRODUCTION — **Production Director,** Peter Holm. **Production Coordinator,** Marlene Stibal. **Supervisor,** Henry Fling. **Systems Manager,** Tom Plau. **Typesetting Manager,** Carol Polack. **Art Director,** Tom Monahan

Computerworld Stock Trading Summary

All statistics compiled computed and formatted by TRADE QUOTES INC Cambridge Mass 02139

CLOSING PRICES WEDNESDAY, JULY 7, 1982

F X C H	1981-82 RANGE (1)	CLOSE JULY 7 1982	WEEK NET CHANGE	WEEK PCT CHANGE
COMPUTER SYSTEMS				
A AMDAHL CORP	18- 48	17 3/4	-1	-5.3
N BURROUGHS CORP	28- 72	31	- 1/2	-1.6
O COMPUTER AUTOMATION	8- 28	9 1/4	+ 1/4	+2.7
A CONTROL DATA CORP	15- 42	23 7/8	- 1/2	-2.0
N CRAY RESEARCH INC	20- 45	23	-1	-4.1
N DATA GENERAL CORP	24- 87	25	- 5/8	-2.4
N DATAPOINT CORP	11- 68	12 1/8	0	0.0
N DIGITAL EQUIPMENT	86-113	87 1/2	-7 3/8	-3.7
A EECO INC	6- 10	9 1/4	- 3/8	-4.3
N ELECTRONIC ASSOC.	5- 13	8 7/8	+ 1/8	+1.8
A FLOATING POINT SYST	13- 30	18 1/2	- 3/4	-2.7
N FORDFORD	25- 62	25 3/4	+2	+8.0
O FULCRUM COMP GRP	1- 3	1/4	0	0.0
O GENERAL AUTOMATION	3- 18	3 7/8	0	0.0
N HARRIS CORP	21- 60	23 5/8	-1	-4.0
N HEWLETT-PACKARD CO	23- 34	41 1/4	-1 1/4	-2.8
N HONEYWELL INC	63-115	86 1/4	- 3/4	-1.1
N IBM	46- 73	81	+ 3/8	+0.6
O IPL SYSTEMS INC	8- 13	5 3/4	0	0.0
O MAGNUSON COMP SYSTS	3- 32	3 5/8	- 3/4	-22.2
N MANAGEMENT ASSIST	8- 26	10 3/8	0	0.0
O MINI COMPUTER SYST	0- 4	3/8	0	0.0
N MODULAR COMPUTER SYS	7- 32	7 3/4	- 1/4	-3.1
O NOVUS DATA SCI	10- 32	11 1/2	0	0.0
N NCR	38- 76	51 3/8	-1 1/4	-2.3
N PERKIN-ELMER	18- 38	17 7/8	+ 1/8	+0.7
A PRIME COMPUTER INC	18- 48	18 3/8	-2	-10.7
O SPERRY CORP	21- 65	21 3/4	- 3/4	-3.2
O TANDEM COMPUTERS INC	13- 35	17 1/2	-6 1/2	-23.0
O TEXAS INSTRUMENTS	71-151	88 1/4	- 3/8	-0.4
A WANG LABS.	22- 48	22 5/8	-1 1/8	-4.7
LEASING COMPANIES				
O BOOTHE FINANCIAL CP	18-29	25 1/2	0	0.0
A CONDISCO INC	16- 27	17 3/4	- 1/2	-2.7
P COMMERCE GROUP CORP	1- 1	3/8	0	0.0
O COMPUTER INVESTORS GRP	1- 2	3/8	0	0.0
O CONTINENTAL INFO SYS	4- 9	7 3/4	0	0.0
N DPF INC	5- 13	8 1/8	- 1/2	-5.7
O ITEL	1- 5	5/8	0	0.0
O LEASPAC CORP	1- 2	1/8	0	0.0
A M.G. LEASING	18- 30	22 1/2	+ 3/4	+3.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
; =NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
D-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

B N C H	1981-82 RANGE (1)	CLOSE JULY 7 1982	WEEK NET CHANGE	WEEK PCT CHANGE
SOFTWARE & EDP SERVICES				
O ADVANCED COMP TECH	1- 8	1 1/2	0	0.0
O ADVANCED SYSTEMS INC	10- 15	10 3/4	+ 1/2	4.4
O ANACOMP INC	10- 18	12 1/2	- 3/8	-2.8
O ANALYSTS INTL CORP	3- 14	5	0	0.0
A APPLIED DATA RES.	13- 25	10 3/8	- 6/8	-3.1
O ASK COMPUTER SYSTEMS	11- 17	15 3/4	- 5/8	-3.8
O ASTRODYNE CORP INC	1- 8	1 3/8	0	0.0
B AUTOMATIC DATA PROC	22- 32	22 6/8	-1 3/4	-7.1
O CDA COMPUTER ASSOC	4- 23	8 1/2	- 1/4	-3.7
O COMPUTER ASSOC INT'L	12- 29	17 3/4	0	0.0
O COMPUTER HORIZONS	1- 3	2	0	0.0
O COMPUTER NETWORK	4- 8	8 1/4	- 1/4	-3.8
O COMPUTER SCIENCES	11- 30	11 7/8	- 3/8	-3.0
O COMPUTER TASK GROUP	10- 23	10 2/4	0	0.0
O COMPUTER USAGE	2- 10	2 1/2	+ 1/8	+6.2
O CONSERV CORP	6- 18	11 3/4	- 3/4	-6.0
O CONSHARE	6- 21	5 3/4	0	0.0
A CULLINANE DATABASE	15- 37	24 3/4	-5 1/8	-17.1
O DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O DATATAB	1- 4	1/2	- 1/6	-24.9
O DYATRON CORP	2- 11	2 3/8	0	0.0
N ELECTRONIC DATA SYST	15- 30	26 1/8	- 7/8	-3.2
O INFORMATICS INC	10- 23	10 1/2	-2	-16.0
O INSYTE CORP	1- 9	3 1/8	0	0.0
O IPS COMPUTER MARKET.	1- 3	1 1/4	0	0.0
O KEANE ASSOCIATES	4- 8	4	- 1/4	-3.8
A LOGICON	12- 38	15 1/4	+ 1/2	+3.3
O MAGI SCI AMER INC	17- 26	21 1/4	-1	-4.4
O MATHEMATICS INC	12- 26	13 3/4	- 1/4	-1.7
O MATHEMATICAL APP GRP	14- 20	16	-1	-5.2
O NATIONAL DATA CORP	13- 28	15 3/8	-2 3/8	-13.0
O PANSOPHIC SYSTEMS	6- 16	10 3/4	+ 1/4	+2.3
N PLANNING RESEARCH	5- 13	8 1/2	0	0.0
O PROGRAMMING & SYS	1- 2	1 3/8	0	0.0
O REYNOLDS & REYNOLD	15- 28	20 1/4	+ 1/4	+1.2
O SEI CORP	17- 28	22 3/4	- 1/2	-2.1
O SHARED MEDICAL SYST	28- 37	28	0	0.0
O STSC INC	6- 28	10 1/8	+ 1/8	+1.2
O SCIENTIFIC COMPUTERS	6- 18	6 6/8	- 3/8	-8.6
O SOFTWARE AG	6- 23	5 3/8	- 1/4	-4.4
B TYMSHARE INC	13- 50	13 1/4	-1	-3.0
A URS CORP	11- 16	11 1/4	- 3/8	-3.2
O WYLY CORP	7- 20	6	+ 1/8	+1.4
PERIPHERALS & SUBSYSTEMS				
A AM INTERNATIONAL	1- 10	1 1/4	0	0.0
A ANDERSON JACOBSON	8- 28	8 1/8	- 1/2	-6.1
O AUTO-TROL TECHNOLOGY	8- 52	12 1/8	- 1/8	-1.0
O BANCTEC INC	7- 39	7 1/2	0	0.0
O BERKIVE INT'L	6- 10	6 1/8	- 3/8	-6.7
A BOLT,BERANEK & NEW	9- 25	10 1/2	- 1/4	-1.5
O CAMDEX CORP	2- 6	3 1/4	- 1/4	-10.0
N CENTRONICS DATA CORP	7- 40	8 6/8	- 7/8	-9.3
A CETEC CORP	4- 8	4	0	0.0
O COGNITRONICS	2- 11	3 6/8	+ 1/8	+3.6
O COMPUTER COMMUN.	1- 2	1/2	0	0.0

F X C H	1981-82 RANGE (1)	CLOSE JULY 7 1982	WEEK NET CHANGE	WEEK PCT CHANGE
A COMPUTER CONSOLES	16- 28	16 1/8	-1 1/8	-5.5
O COMPUTER DEVICES INC	4- 10	8 1/8	4 1/4	+2.1
O COMPUTER TRANSCEIVER	2- 8	4 3/4	+.1/4	+5.5
N COMPUTERVISION CORP	30- 48	25 1/8	- 7/8	-3.3
N CONRAC CORP	17- 28	23 5/8	-1 1/8	-4.5
A DATA ACCESS SYSTEMS	2- 11	1 3/4	0	0.0
A DATAPRODUCTS CORP	16- 44	17 1/4	0	0.0
O DATARAM CORP	4- 15	8 1/4	- 5/8	-6.6
O DATUM INC	2- 5	2	- 1/8	-5.0
O DAVID JAMISON CARLYL	3- 7	3 1/8	- 1/8	-3.8
O DECISION DATA COMPUT	3- 8	4 3/4	- 3/8	-7.3
O DELTA DATA SYSTEMS	2- 4	1 1/2	- 1/8	-7.8
N ELECTRONIC M & M	3- 8	4 1/8	+ 1/8	+3.1
O EVANS & SUTHERLAND	18- 41	24 1/2	+ 2/8	-2.0
O GEN L DATA COMM INB	7- 10	9 3/4	- 1/8	-1.4
O GENERAL TERMINAL CP	6- 4	3/8	0	0.0
O GREAT SOUTHWEST IND	1- 12	4 1/2	- 1/4	-5.5
N HAZELTINE CORP	19- 38	24 1/4	- 1/2	-2.0
O INFORMATION INTL INC	6- 17	11	+ 1/4	+2.3
O INTEL CORP	21- 51	29 1/8	-2	-6.5
O IPL SYSTEMS INC	8- 15	5 3/4	0	0.0
A LUNDY ELECTRONICS	7- 10	8 2/4	- 1/8	-2.3
A MSI DATA CORP	11- 37	13 3/8	- 1/4	-1.5
O NETWORK SYSTEMS CORP	14- 25	17 1/2	+ 7/8	+5.7
O OMEX	3- 8	3 1/2	0	0.0
A PARADYNE CORP	25- 52	27 3/4	- 1/8	-0.4
A PERIPHL CORP	7- 17	8 1/8	- 3/8	-3.0
O QANTEX CORP	6- 23	18 1/4	- 3/4	-4.0
N RECOGNITION EQUIP	4- 21	4 3/8	+ 1/8	+2.8
O SCAN DATA	1- 3	1 1/2	+ 1/4	+20.0
N STORAGE TECHNOLOGY	10- 40	20	-1	-4.7
O SYKES DATATRONICS	6- 24	10 1/4	- 3/4	-6.8
A T DAM INC	7- 18	7 1/4	-1	-12.1
A TFC INC	4- 11	6 1/5	- 1/2	-5.1
A TERTRONIX INC	43- 78	61 6/8	-1	-1.0
O TELEX	6- 14	7 7/8	- 1/8	1.5
O TESDATA SYSTEMS CP	3- 17	8	- 1/2	-14.2
A TINCPLEX INC	7- 18	8 6/8	- 1/4	-2.8
O VISUAL TECHNOLOGY	10- 15	12 1/4	+1	+8.6
O WILTEK INC	1- 3	1 1/8	0	0.0
SUPPLIES & ACCESSORIES				
N AMERICAN BUS PRODS	11- 17	12 1/2	+ 1/4	+2.0
O BALTIMORE BUS FORMS	1- 2	1	- 1/4	-20.0
O BARRY WRIGHT	14- 24	14 1/4	- 3/4	-5.0
O CYBERNETICS INC	1- 3	1	0	0.0
A DUPLEX PRODUCTS INC	12- 13	14	0	0.0
A ERNID BUS. FORMS	15- 23	20	0	0.0
O 3M COMPANY	48- 63	52	-1 1/4	-2.3
O MOORE CORP LTD	26- 38	27	- 1/8	-0.8
B NASHUA CORP	11- 33	10 7/8	-1 3/4	-12.1
O STANDARD REGISTER	30- 42	38 1/2	+ 1/4	+0.8
A TAB PRODUCTS CO	14- 30	14	- 3/8	-2.8
O WALLACE BUS FORMS	22- 36	29 5/8	- 1/2	-1.6

Why use their flexible discs:

BASF, Control Data, Dysan, IBM, Kybe, Maxell, Nashua, Scotch, Syncom, Verbatim or Wabash

when you could be using

MEMOREX

high quality error free discs?

Product Description	Part #	CE quant. 100 price per disc ($)
8" SSSD IBM Compatible (128 B/S, 26 Sectors)	3062	2.09
8" SSSD Shugart Compatible, 32 Hard Sector	3015	2.09
8" SSSD CPT 8000 Compatible, Soft Sector	3045	2.99
8" SSDD IBM Compatible (128 B/S, 26 Sectors)	3090	2.74
8" DSDD Soft Sector (Unformatted)	3102	3.34
8" DSDD Soft Sector (128 B/S, 26 Sectors)	3115	3.34
8" DSDD Soft Sector (256 B/S, 26 Sectors)	3103	3.34
8" DSDD Soft Sector (512 B/S, 15 Sectors)	3114	3.34
8" DSDD Soft Sector (1024 B/S, 8 Sectors)	3104	3.34
5¼" SSDD Soft Sector w/Hub Ring	3481	2.34
5¼" SSDD 10 Hard Sector w/Hub Ring	3483	2.34
5¼" SSDD 16 Hard Sector w/Hub Ring	3485	2.34
5¼" DSDD Soft Sector w/Hub Ring	3491	3.09
5¼" DSDD 10 Hard Sector w/Hub Ring	3493	3.09
5¼" DSDD 16 Hard Sector w/Hub Ring	3495	3.09
5¼" SSDD Soft Sector w/Hub Ring (96 TPI)	3504	2.99
5¼" DSDD Soft Sector w/Hub Ring (96 TPI)	3501	3.99

SSSD = Single Sided Single Density; SSDD = Single Sided Double Density
DSDD = Double Sided Double Density; TPI = Tracks per inch

Memorex Flexible Discs...The Ultimate in Memory Excellence

Free Memorex Mini-Disc Offer - Save 10%
Every carton of 10 Memorex 5¼ inch mini-discs sold by Communications Electronics, now has a coupon good for a *free* Memorex mini-disc. For every case of 100 Memorex mini-discs you buy from CE, you'll get 10 free mini-discs directly from Memorex. There is no limit to the number of discs you can purchase on this special offer. This offer is good only in the U.S.A. and ends on December 31, 1982.

Quality
Memorex means quality products that you can depend on. Quality control at Memorex means starting with the best materials available and continual surveillance throughout the entire manufacturing process. The benefit of Memorex's years of experience in magnetic media production, resulting, for instance, in proprietary coating formulations. The most sophisticated testing procedures you'll find anywhere in the business.

100 Percent Error Free
Each and every Memorex Flexible Disc is certified to be 100 percent error free. *Each* track of *each* flexible disc is tested, individually, to Memorex's stringent standards of excellence. They test signal amplitude, resolution, low-pass modulation, overwrite, missing pulse error and extra pulse error. Rigid quality audits are built into every step of the manufacturing process and stringent testing result in a standard of excellence that assures you, our customer, of a quality product designed for increased reliability and consistent top performance.

Customer-Oriented Packaging
The desk-top box containing ten discs is convenient for filing and storage. Both box labels and jacket labels provide full information on compatibility, density, sectoring, and record length. Envelopes with multi-language care and handling instructions and and color-coded removable labels are included. A write-protect feature is available to provide data security.

Full One Year Warranty—Your Assurance of Quality
Memorex Flexible Discs will be replaced free of charge by Memorex if they are found to be defective in materials or workmanship within one year of the date of purchase. Other than replacement, Memorex will not be responsible for any damages or losses (including consequential damages) caused by the use of Memorex Flexible Discs.

Quantity Discounts Available
Memorex Flexible Discs are packed 10 discs to a carton and 10 cartons to a case. Please order only in increments of 100 units for quantity 100 pricing. We are also willing to accommodate your smaller orders. Quantities less than 100 units are available in increments of 10 units at a 10% surcharge. Quantity discounts are also available. Order 500 or more discs at the same time and deduct 1%; 1,000 or more saves you 2%; 2,000 or more saves you 3%; 5,000 or more saves you 4%; 10,000 or more saves you 5%; 25,000 or more saves you 6%; 50,000 or more saves you 7% and 100,000 or more discs earns you an 8% discount off our super low quantity 100 price. Almost all Memorex Flexible Discs are immediately available from CE. Our warehouse facilities are equipped to help us get you the quality product you need, when you need it. If you need further assistance to find the flexible disc that's right for you, call the Memorex compatibility hotline. Dial toll-free 800-538-8080 and ask for the *flexible disc hotline* extension 0997. In California dial 800-672-3525 extension 0997. Outside the U.S.A. dial 408-987-0997.

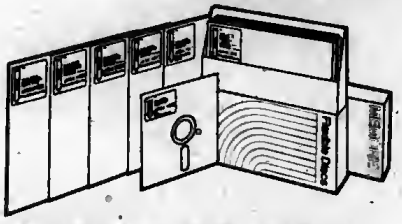
Buy with Confidence
To get the fastest delivery from CE of your Memorex Flexible Discs, send or phone your order directly to our Computer Products Division. Be sure to calculate your price using the CE prices in this ad. Michigan residents please add 4% sales tax. Written purchase orders are accepted from approved government agencies and most well rated firms at a 30% surcharge for net 30 billing. All sales are subject to availability, acceptance and verification. All sales are final. Prices, terms and specifications are subject to change without notice. Out of stock items will be placed on backorder automatically unless CE is instructed differently. Minimum *prepaid* order $50.00. Minimum *purchase order* $200.00. International orders are invited with a $20.00 surcharge for special handling in addition to shipping charges. All shipments are F.O.B. Ann Arbor, Michigan. No COD's please. Non-certified and foreign checks require bank clearance.

Mail orders to: **Communications Electronics**, Box 1002, Ann Arbor, Michigan 48106 U.S.A. Add $8.00 per case or partial-case of 100 8-inch discs or $6.00 per case or partial case of 100 5¼-inch mini-discs for U.P.S. *ground* shipping and handling in the continental U.S.A. If you have a Master Card or Visa card, you *may* call anytime and place a credit card order. Order toll-free in the U.S. Dial 800-521-4414., if you are outside the U.S. or in Michigan, dial 313-994-4444. Order your high quality, error free Memorex discs today.

Copyright © 1982 Communications Electronics™ Ad #051782

Free disc offer Save 10%

Order Toll-Free!
(800) 521-4414
In Michigan (313) 994-4444



For Data Reliability—Memorex Flexible Discs

COMMUNICATIONS ELECTRONICS™

Computer Products Division

854 Phoenix □ Box 1002 □ Ann Arbor, Michigan 48106 U.S.A.
Call TOLL-FREE (800) 521-4414 or outside U.S.A. (313) 994-4444